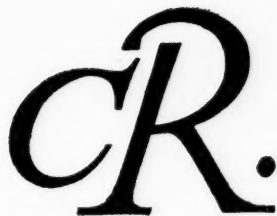


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*Contents*

BERTRAND RUSSELL  
Non-Demonstrative Inference 237

H. C. BROCKEL  
The Significance of the St. Lawrence Seaway 258

HARVEY GROSS  
Music and the Analogue of Feeling:  
Notes on Eliot and Beethoven 269

HUDSON HOAGLAND  
The Seven Deadly Sins: Wrath 289

THOMAS J. J. ALTIZER  
Science and Gnosis in Jung's Psychology 304

JAMES E. MILLER, JR.  
Walt Whitman and the Secret of History 321

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LIST OF CONTRIBUTORS ii

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## NON-DEMONSTRATIVE INFERENCE\*

*Bertrand Russell*

### I

I RETURNED to England in June 1944, after three weeks on the Atlantic. Trinity had awarded me a five-years lectureship and I chose as the subject of my annual course, 'Non-Demonstrative Inference', or N-D.I. for short. I had become increasingly aware of the very limited scope of deductive inference as practiced in logic and pure mathematics. I realized that all the inferences used both in common sense and in science are of a different sort from those in deductive logic and are such that, when the premisses are true and the reasoning correct, the conclusion is only probable. During the first six months after my return from America I had rooms in College and enjoyed a feeling of peacefulness in spite of V1's and V2's. I set to work to investigate probability and the kind of inference which confers probability. I found the subject at first somewhat bewildering as there was a tangle of different problems and each thread had to be separated from every other. The positive outcome appeared in *Human Knowledge*, but I did not, in that book, mention the various perplexities and tentative hypotheses through which I had arrived at my final conclusions. I now think this was a mistake, as it made the conclusions appear more slap-dash and less solid than, in fact, they were.

I found the subject of non-demonstrative inference much larger and much more interesting than I had expected. I found that it had in most discussions been unduly confined

\* This paper is from the book *My Philosophical Development* by Bertrand Russell, and is printed here by permission of Simon and Schuster, Publishers. Copyright by George Allen & Unwin, Ltd., 1959.

to the investigation of induction. I came to the conclusion that inductive arguments, unless they are confined within the limits of common sense, will lead to false conclusions much more often than to true ones. The limitations imposed by common sense are easy to feel but very difficult to formulate. In the end, I came to the conclusion that, although scientific inference needs indemonstrable extra-logical principles, induction is not one of them. It has a part to play, but not as a premiss. I shall return to this subject presently.

Another conclusion which was forced upon me was that not only science, but a great deal that no one sincerely doubts to be knowledge, is impossible if we only know what can be experienced and verified. I felt that much too much emphasis had been laid upon experience, and that, therefore, empiricism as a philosophy must be subjected to important limitations.

I was at first bewildered by the vastness and multiplicity of the problems involved. Seeing that it is of the essence of non-demonstrative inference to confer only probability upon its conclusions, I thought it prudent to begin with an investigation of probability, especially as, on this subject, there existed a body of positive knowledge floating like a raft upon the great ocean of uncertainty. For some months, I studied the calculus of probability and its applications. There are two kinds of probability, of which one is exemplified by statistics, and the other by doubtfulness. Some theorists have thought that they could do with only one of these, and some have thought that they could do with only the other. The mathematical calculus, as usually interpreted, is concerned with the statistical kind of probability. There are fifty-two cards in a pack, and therefore, if you draw a card at random, the chance that it will be the seven of diamonds is one in fifty-two. It is generally assumed, without conclusive evidence, that, if you drew cards at random a great many times, the seven of diamonds would appear about once in every



fifty-two times. The subject of probability owed its origin to the interest of aristocrats in games of chance. They hired mathematicians to work out systems which should make gambling lucrative rather than expensive. The mathematicians produced a lot of interesting work, but it does not appear to have enriched their employers.

The theory which considers that all probability is of this statistical kind is called the 'frequency' theory. What, for example, is the probability that a person chosen at random from the population of England will be called 'Smith'? You find out how many people there are in England and how many of them are called 'Smith'. You then *define* the probability that a person chosen at random will be called 'Smith' as the ratio of the number of Smiths to the number of the total population. This is a perfectly precise mathematical conception, having nothing whatever to do with uncertainty. Uncertainty only comes in when you *apply* the conception as, for example, if you see a stranger across the street and you bet a hundred to one that he is not called 'Smith'. But so long as you do not apply the calculus of probability to empirical material, it is a perfectly straightforward branch of mathematics with all the exactness and certainty characteristic of mathematics.

There is, however, another, quite different, theory which was adopted by Keynes in his *Treatise on Probability*. He held that there can be a relation between two propositions consisting in the fact that one of them makes the other probable in a greater or less degree. He held that this relation is indefinable and capable of varying degrees, the extreme degrees being when the one proposition makes the truth of the other certain, and when it makes its falsehood certain. He did not believe that all probabilities are numerically measurable or reducible, even in theory, to frequencies.

I came to the conclusion that, wherever probability is definite, the frequency theory is applicable, but that there is an-

other conception, misleadingly called by the same name, to which something more like Keynes's theory is applicable. This other conception, I called 'degree of credibility' or 'degree of doubtfulness'. It is obvious that we are much more certain about some things than we are about others, and that our uncertainty often has no statistical aspect. It is true that the statistical aspect can sometimes be discovered where it is not obvious at first sight. I read a book about the Saxon invasion of England which led me to think that Hengist was indubitable but Horsa was perhaps a legend. It would perhaps be possible to put the evidence for Horsa alongside of evidence for other historical characters, and discover in what proportion of cases such evidence had been found to lead aright or to lead astray. But, although this sort of thing is sometimes possible, it certainly does not cover the ground and leaves degrees of doubtfulness as a necessary conception in the investigation of what passes for knowledge.

It seemed to me that, in the problems with which I was concerned, doubtfulness was much more important than mathematical probability. It was not only that, in the inferences with which I was concerned, the premisses, even if true, do not make the conclusion certain. What was much more important was that the premisses themselves are uncertain. This led me to the conclusion that the mathematical aspects of probability have less to do than might be thought with the problems of scientific inference.

I next devoted myself to a collection of instances where we make inferences that we feel to be quite solid although the inferences in question can only be validated by extra-logical principles. In collecting such instances, I accepted whatever would only be doubted by a philosopher in defence of a theory. Broadly speaking, I did not reject common sense, except where there was some very cogent scientific argument against it. Take a very simple example: suppose you are walking out-of-doors on a sunny day; your shadow walks with

you; if you wave your arms, your shadow waves its arms; if you jump, your shadow jumps; for such reasons, you unhesitatingly call it *your* shadow and you have no doubt whatever that it has a causal connection with your body. But, although the inference is one which no sane man would question, it is not logically demonstrative. It is not logically impossible that there should be a dark patch going through movements not unlike the movements of your body, but having an independent existence of its own. I attempted, by collecting as many instances as I could think of in which non-demonstrative inferences seem to us unquestionable, to discover by analysis what extra-logical principles must be true if we are not mistaken in such cases. The evidence in favour of the principles is derived from the instances and not vice versa. There seemed to me to be several such principles, but I came to the conclusion that induction is not one of them.

I found that, for lack of analysis, people had admitted blocks of non-demonstrative inference because they had a subjective prejudice in favour of certain kinds of knowledge, and had rejected other blocks on account of a contrary prejudice. It appeared to me that, in any particular case of an inference which seemed unquestionable, one should discover the principle upon which it depended and accept other inferences depending upon the same principle. I found that almost all philosophers had been mistaken as to what can and what cannot be inferred from experience alone. I divided the problem of empirical knowledge into three stages: (1) knowledge about myself; (2) knowledge about other minds—which includes the acceptance of testimony; and (3) knowledge about the physical world. Beginning with knowledge about myself, I found that solipsism as commonly expounded admits a great deal that is incompatible with the caution by which such a system is inspired. I do not remember anything that happened to me before I was two years old, but I do not think it plausible to maintain that I began to

exist at the age of two. And in later life, I am quite convinced that many things happened to me which I do not remember. Even what I remember may have never happened. I have sometimes had dreams in which there were dream-memories that were wholly imaginary. I once dreamt that I was in terror of the police because I 'remembered' that, a month ago, Whitehead and I together had murdered Lloyd George. It follows that my recollecting something is not, *per se*, conclusive evidence that the something really happened. The solipsist, therefore, if he is to attain the logical safety of which he is in search, will be confined to what I call 'solipsism of the moment'. He will say not only 'I do not know whether the physical world exists or whether there are minds other than my own', but he will have to go further and say, 'I do not know whether I had a past or shall have a future, for these things are just as doubtful as the existence of other people or of the physical world'. No solipsist has ever gone as far as this, and therefore every solipsist has been inconsistent in accepting inferences about himself which have no better warrant than inferences about other people and things.

A very great deal of what we all unquestioningly accept as knowledge depends upon testimony, and testimony, in turn, depends upon the belief that there are other minds besides our own. To common sense, the existence of other minds does not appear open to doubt, and I do not myself see any reason to disagree with common sense on this point. But, undoubtedly, it is through experiences of my own that I am led to believe in the minds of others; and, undoubtedly, as a matter of pure logic, it would be possible for me to have these experiences even if other minds did not exist. Part of our reason for believing in other minds is derived from analogy, but part is derived from another source which has a wider application. Suppose you compare two copies of the same book and find that they agree word for word, you cannot resist the conclusion that they have a common cause, and

you can trace this common cause backward through composers and publishers to the author. You do not find it credible that the author's body went through the motions of writing the book without his having any thoughts meanwhile. Such grounds for admitting other minds are not demonstrative in the logical sense. You might have experiences in a dream which would be equally convincing while you still slept, but which you would regard as misleading when you woke. Such facts warrant a certain degree of doubtfulness, but usually only a very small degree. In the immense majority of cases, they justify you in accepting testimony if there is no evidence to the contrary.

I come next to purely physical occurrences. Take, for example, our reason for believing in sound-waves. If a loud explosion occurs at some point, the time when different people hear it depends upon their distance from that point. We find it incredible that these different people, at different times, should all experience a loud noise, unless something had been happening in the intervening spaces. A system of events at places where there were ears, combined with a total absence of connected events elsewhere, strikes us as altogether too staccato to be credible. An even simpler example is the persistence of material objects. We cannot believe that Mount Everest ceases to exist when no one is seeing it, or that our room goes out with a pop when we leave it. There is no reason why we should believe such absurdities. The principles which lead us to reject them are essentially the same as those which lead us to believe that things have happened to us which we have now forgotten.

## II

Not only science, but a great deal of common sense, is concerned, not with individual occurrences, but with general laws. Our knowledge of general laws, however, when it is empirical, is inferred, validly or invalidly, from our knowl-

edge of a number of particular occurrences. 'Dogs bark' is a general law, but it could not be known if people had not heard particular dogs barking on particular occasions. I found that our knowledge of such particular occurrences raises problems which some philosophers, notably the logical positivists, have not sufficiently considered. These problems, however, are not those involved in non-demonstrative inference, since the inferences with which we are concerned can only be justifiable in virtue of some general law such as you employ when, hearing a bark, you infer a dog. The laws that science seeks are, for the most part, in some sense causal. And this brings me to the question, 'What do we mean by causal laws, and what evidence is there of their occurrence?'

It used to be the custom among philosophers to think that causal laws can be stated in the form 'A causes B', interpreted as meaning that whenever an event of a certain kind A occurs, it is followed by an event of another specified kind, B. It was held by many that a causal sequence involves something more than invariability and must have some character that can be called 'necessity'. Many empiricists, however, denied this and thought that nothing was involved except invariable sequence. This whole point of view, however, could never have persisted among philosophers if they had had any acquaintance with science. Causal laws must be either not invariable or such as state only tendencies. In classical dynamics they take the form of differential equations, stating acceleration, not actual occurrences. In modern physics the laws have become statistical: they do not state what will happen in any particular case, but only different things, each of which will happen in an assigned proportion of cases. For such reasons, causation is no longer what it used to be in the books of old-fashioned philosophers. Nevertheless, it still retains an essential place. Take, for example, what we mean by a single 'thing' which is more or less persistent. This 'thing' must really consist of a series of sets of occurrences, each set char-

acterizing what we may call a momentary state of the 'thing'. The states of the 'thing' at different times are, often, though not always, connected by means of laws which can be stated without mentioning other 'things'. If this were not the case, scientific knowledge could never get a start. Unless we can know something without knowing everything, it is obvious that we can never know something. And this applies, not only to particular events, but also to the laws connecting events. In physics, atoms and molecules persist for a time, and, if they did not, the conception of motion would become meaningless. A human body persists for a time, although the atoms and molecules of which it is composed are not always the same. A photon which travels from a star to a human eye persists throughout its journey, and, if it did not, we should not be able to state what we mean by seeing a star. But all these kinds of persistence are only usual, not invariable, and the causal laws with which science begins must state only an approximation to what usually happens. Whether, in the end, something more exact is attainable, we do not know. What I think we can say is something like this: given any event, there is usually, at any neighbouring time and in some neighbouring place, an event very like the given event; and, as a rule, it is possible to discover some law approximately determining its small difference from the given event. Some such principle is necessary to explain the approximate persistence of many 'things', and also to explain the difference between perceiving A and perceiving B—for example, if A and B are stars, both of which we are seeing.

I give the name of 'causal line' to a series of events having the property that from any one of them something can be inferred as to neighbouring events in the series. It is the fact that such causal lines exist which has made the conception of 'things' useful to common sense, and the conception of 'matter' useful to physics. It is the fact that such causal lines are approximate, impermanent, and not universal which has



caused modern physics to regard the conception of 'matter' as unsatisfactory.

There is another conception which seemed to me of great utility in non-demonstrative inference, namely that of 'structure'. It seems reasonable to suppose that, if you see red in one direction and blue in another, there is some difference between what is happening in the one direction and what is happening in the other. It follows that, though we may be compelled to admit that the external causes for our sensations of colour are not themselves coloured in the same sense in which our sensations are, nevertheless, when you see a pattern of colours, there must be a similar pattern in the causes of your sensations of colour. The conception of space-time structure as something which often remains constant, or approximately constant, throughout a series of causally connected events, is very important and very fruitful. Suppose, to take a very simple example, A reads aloud from a book and B takes down what he hears from dictation, and what A saw in the book is verbally identical with what B has written, it would be quite absurd to deny a causal connection between four sets of events—viz. (1) what is printed in the book, (2) the noises made by A in reading aloud, (3) the noises heard by B, and (4) the words written by B. The same sort of thing applies to the relation between a gramophone record and the music that it produces. Or, again, consider broadcasting, where sounds are transformed into electro-magnetic waves, and the electro-magnetic waves are transformed back into sound. It would be impossible for the spoken sounds and the heard sounds to resemble each other as closely as they do unless the intervening electro-magnetic waves had had a space-time structure very closely similar to that of the words, spoken and heard. There are, in nature, innumerable examples of complex structures transmitted causally throughout changes of intrinsic quality, such as those between sound and electro-magnetic waves in broadcasting. In fact, all visual and audi-



tory perceptions have this character of transmitting structure but not intrinsic quality.

People unaccustomed to modern logic find it difficult to suppose that we can know about a space-time structure without knowing the qualities that compose it. This is part of a larger aspect of knowledge. Unless we are to land ourselves in preposterous paradoxes, we shall find it necessary to admit that we may know such propositions as 'all A is B' or 'some A is B', without being able to give any instance of A—e.g., 'all the numbers that I have never thought of and never shall think of are greater than a thousand'. Although this proposition is undeniable, I should contradict myself if I attempted to give an instance. The same sort of thing applies to space-time structure in the purely physical world, where there is no reason to suppose that the qualities composing the structure bear any intrinsic resemblance to the qualities that I know in sensible experience.

The general principles necessary to validate scientific inferences are not susceptible of proof in any ordinary sense. They are distilled out by analysis from particular cases which seem totally obvious, like the one that I gave a moment ago in which A dictates to B. There is a gradual development from what I call 'animal expectation' up to the most refined laws of quantum physics. The whole process starts from experiencing A and expecting B. An animal experiences a certain smell and expects the food to be good to eat. If its expectation were usually mistaken, it would die. Evolution and adaptation to environment cause expectations to be more often right than wrong, although the expectations go beyond anything logically demonstrable. Nature, we may say, has certain habits. The habits of animals must have a certain adaptation to the habits of nature if the animals are to survive.

This would be a poor argument if employed against Cartesian scepticism. But I do not think it is possible to get any-

where if we start from scepticism. We must start from a broad acceptance of whatever seems to be knowledge and is not rejected for some specific reason. Hypothetical scepticism is useful in logical dissection. It enables us to see how far we can get without this or that premiss—as, for example, we can inquire how much of geometry is possible without the axiom of parallels. But it is only for such purposes that hypothetical scepticism is useful.

### III

Before explaining the exact epistemological function of the indemonstrable premisses of non-demonstrative inference something further must be said about induction.

Induction, as I said above, is not among the premisses of non-demonstrative inference. But this is not because it is not used; it is because in the form in which it is used it is not indemonstrable. Keynes, in his *Treatise on Probability*, made an extremely able investigation of the possibility of deriving induction from the mathematical theory of probability. The question that he had to investigate was this: given a number of instances of As which are Bs and no contrary instances, in what circumstances does the probability of the generalization 'all A is B' approach certainty as a limit when the number of As that are Bs is continually increased? The conclusion that he arrives at is that two conditions must be fulfilled if this is to happen. The first and more important of these conditions is that, before we know any instances of As that are Bs, the generalization 'all A is B' should have a finite probability on the basis of the remainder of our knowledge. The second condition is that the probability of our observing only favourable instances, if the generalization is false, should tend to zero as a limit when the number of inferences is sufficiently increased. This condition is found by Keynes to be satisfied if there is some probability short of certainty, say P, such that, given that the generalization is false and that  $n - 1$  As have

been found to be Bs, the chance that the  $n$ th A will be found to be a B is always less than P provided  $n$  is sufficiently great.

The second of these two conditions is less important than the first and is also much less inconvenient. I shall concentrate attention upon the first of the two conditions.

How are we to know that some suggested generalization has a finite probability in its favour before we have examined any of the evidence for or against it? It is this that we must know if Keynes's argument is to give any high degree of probability to a generalization when we know a great many instances in its favour and none against it. The postulates at which I arrived by an analysis of instances of non-demonstrative inference were intended to be such as would confer this finite *a priori* probability upon certain generalizations and not upon others. It will be observed that, in order that the postulates in question should fulfil their function, it is not necessary that they should be certain; it is only necessary that they should have a finite probability. In this respect they differ very profoundly from the kind of *a priori* principles that idealistic philosophers have sought, for such principles have been supposed by their advocates to possess a certainty greater than that of most empirical knowledge.

The postulates at which I finally arrived were five. I do not lay any stress upon their exact formulation. I think it highly probable that their number could be reduced and that they could be stated with more precision. But, while I am not persuaded that they are all *necessary*, I do think they are *sufficient*. It should be noted that all of them state only probabilities, not certainties, and are designed only to confer that finite antecedent probability which Keynes needs to validate his inductions. I have already said something in a preliminary way about these postulates, but I will now repeat them more exactly and more explicitly.

The first of these I call 'the postulate of quasi-permanence', which may be regarded, in a sense, as replacing Newton's first

law of motion. It is in virtue of this postulate that common sense is able to operate more or less successfully with the concept of 'persons' and the concept of 'things'. It is also in virtue of this postulate that science and philosophy were able, for a long time, to make use of the concept of 'substance'. What the postulate states is as follows:

Given any event A, it happens very frequently that, at any neighbouring time, there is at some neighbouring place an event very similar to A.

This very similar event will be regarded by common sense as part of the history of the person or thing to whom the event A happened.

The second postulate is that of separable causal lines. This is perhaps the most important of all the five. It enables us, from partial knowledge, to make a partial probable inference. We believe that everything in the universe has, or may have, *some* effect upon everything else, and since we do not know everything in the universe, we cannot tell exactly and certainly what will happen to anything; but we can tell approximately and with probability; and if we could not, knowledge and scientific laws could never get started. The postulate is as follows:

It is frequently possible to form a series of events such that, from one or two members of the series, something can be inferred as to all the other members.

The most obvious examples are such things as sound waves and light waves. It is owing to the permanence of such waves that hearing and sight can give us information about more or less distant occurrences.

The third postulate is that of spatio-temporal continuity, which is mainly concerned to deny action at a distance. It maintains that, when there is a causal connection between two events that are not contiguous, there must be intermediate links in the causal chain. For example, if A hears what B says, we think that some process must have intervened between A and B. I do not feel sure, however, that this postu-

late could not be reduced to a tautology, since physical space-time is entirely inferential and the ordering of space-time events is dependent upon causality.

The fourth postulate, which I call 'the structural postulate', is very important and very fruitful. It is concerned with such cases as a number of people hearing the same speech or seeing the same performance in a theatre or, to take an example with wider scope, seeing the same stars in the sky. What the postulate says is as follows:

When a number of structurally similar complex events are ranged about a centre in regions not widely separated, it is usually the case that all belong to causal lines having their origin in an event of the same structure at the centre.

The importance of space-time structure, which I first emphasized in *The Analysis of Matter*, is very great. It explains how one complex event can be causally connected with another complex event, although they are not in any way qualitatively similar. They need only resemble each other in the abstract properties of their space-time structure. It is obvious that the electro-magnetic waves used in broadcasting cause the sensations of the hearers, but do not resemble them except in structural respects. It is because of the importance of structure that theoretical physics is able to content itself with formulae that are about unexperienced occurrences which need not, except in structure, resemble any of the occurrences that we experience.

The last postulate is that of analogy, the most important function of which is to justify the belief in other minds. The postulate is as follows:

Given two classes of events A and B, and given that, whenever both A and B can be observed, there is reason to believe that A causes B, then if, in a given case, A is observed, but there is no way of observing whether B occurs or not, it is probable that B occurs; and similarly if B is observed, but the presence or absence of A cannot be observed.

The above postulates, I repeat, are justified by the fact that

they are implied in inferences which we all accept as valid, and that, although they cannot be proved in any formal sense, the whole system of science and everyday knowledge, out of which they have been distilled, is, within limits, self-confirmatory. I do not accept the coherence theory of *truth*, but there is a coherence theory of *probability* which is important and I think valid. Suppose you have two facts and a causal principle which connects them, the probability of all three may be greater than the probability of any one, and the more numerous and complex the inter-connected facts and principles become, the greater is the increase of probability derived from their mutual coherence. It is to be observed that, without the introduction of principles, no suggested collection of facts, or supposed facts, is either coherent or inconsistent, since no two facts can either imply or contradict each other except in virtue of some extralogical principle. I believe that the above five principles, or something analogous to them, can form the basis for the kind of coherence which gives rise to the increased probability with which we have been concerned. Something vaguely called 'causality' or 'the uniformity of nature' appears in many discussions of scientific method. The purpose of my postulates is to substitute something more precise and more effective in place of such rather vague principles. I feel no great confidence in the precise postulates above enumerated, but I feel considerable confidence that something of the same sort is necessary if we are to justify the non-demonstrative inferences concerning which none of us, in fact, can feel any doubt.

#### IV

Ever since I was engaged on *Principia Mathematica*, I have had a certain method of which at first I was scarcely conscious, but which has gradually become more explicit in my thinking. The method consists in an attempt to build a bridge between the world of sense and the world of science. I accept

both as, in broad outline, not to be questioned. As in making a tunnel through an Alpine mountain, work must proceed from both ends in the hope that at last the labour will be crowned by a meeting in the middle.

Let us begin with the analysis of some body of scientific knowledge. All scientific knowledge uses artificially manufactured entities of which the purpose is to be easily manipulated by the methods of some calculus. The more advanced the science, the more true this is. Among empirical sciences, it is most completely true in physics. In an advanced science, such as physics, there is, for the philosopher, a preliminary labour of exhibiting the science as a deductive system starting with certain principles from which the rest follows logically and with certain real or supposed entities in terms of which everything dealt with by the science in question can, at least theoretically, be defined. If this labour has been adequately performed, the principles and entities, which remain as the residue after analysis, can be taken as hostages for the whole science in question, and the philosopher need no longer concern himself with the rest of the complicated knowledge which constitutes that science.

But no empirical science is intended merely as a coherent fairy-tale. It is intended to consist of statements having application to the real world and believed because of their relation to that world. Even the most abstract parts of science, such, for instance, as the general theory of relativity, are accepted because of observed facts. The philosopher is thus compelled to investigate the relation between observed facts and scientific abstractions. This is a long and arduous task. One of the reasons for its difficulty is that common sense, which is our starting point, is already infected with theory, though of a crude and primitive kind. What we think that we observe is more than what we in fact observe, the 'more' being added by common-sense metaphysics and science. I am not suggesting that we should wholly reject the metaphysics



and science of common sense, but only that it is part of what we have to examine. It does not belong to either of the two poles of formulated science, on the one hand, or unmixed observation, on the other.

I have been much criticized for applying the methods of mathematical logic to the interpretation of physics, but, in this matter, I am wholly unrepentant. It was Whitehead who first showed me what was possible in this field. Mathematical physics works with a space composed of points, a time composed of instants and a matter composed of punctual particles. No modern mathematical physicist supposes that there are such things in nature. But it is possible, given a higgledy-piggledy collection of things destitute of the smooth properties that mathematicians like, to make structures composed of these things and having the properties which are convenient to the mathematician. It is because this is possible that mathematical physics is more than an idle amusement. And it is mathematical logic which shows how such structures are to be made. For this reason, mathematical logic is an essential tool in constructing the bridge between sense and science of which I spoke above.

The method of Cartesian doubt, which appealed to me when I was young and may still serve as a tool in the work of logical dissection, no longer seems to me to have fundamental validity. Universal scepticism cannot be refuted, but also cannot be accepted. I have come to accept the facts of sense and the broad truth of science as things which the philosopher should take as data, since, though their truth is not quite certain, it has a higher degree of probability than anything likely to be achieved in philosophical speculation.

In the transition from crude fact to science, we need forms of inference additional to those of deductive logic. Traditionally, it was supposed that induction would serve this purpose, but this was an error, since it can be shown that the conclusions of inductive inferences from true premisses are



more often false than true. The principles of inference required for the transition from sense to science are to be attained by analysis. The analysis involved is that of the kinds of inference which nobody, in fact, questions: as, for example, that if, at one moment, you see your cat on the hearth-rug and, at another, you see it in a doorway, it has passed over intermediate positions although you did not see it doing so. If the work of analysing scientific inference has been properly performed, it will appear that concrete instances of such inference are (a) such as no one honestly doubts, and (b) such as are essential if, on the basis of sensible facts, we are to believe things which go beyond this basis.

The outcome of such work is to be regarded rather as science than as philosophy. That is to say, the reasons for accepting it are the ordinary reasons applied in scientific work, not remote reasons derived from some metaphysical theory. More especially, there is no such claim to certainty as has, too often and too uselessly, been made by rash philosophers.

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## V

Mathematics has ceased to seem to me non-human in its subject matter. I have come to believe, though very reluctantly, that it consists of tautologies. I fear that, to a mind of sufficient intellectual power, the whole of mathematics would appear trivial, as trivial as the statement that a four-footed animal is an animal. I think that the timelessness of mathematics has none of the sublimity that it once seemed to me to have, but consists merely in the fact that the pure mathematician is not talking about time. I cannot any longer find any mystical satisfaction in the contemplation of mathematical truth.

The aesthetic pleasure to be derived from an elegant piece of mathematical reasoning remains. But here, too, there were

disappointments. The solution of the contradictions mentioned in an earlier chapter seemed to be only possible by adopting theories which might be true but were not beautiful. I felt about the contradictions much as an earnest Catholic must feel about wicked Popes. And the splendid certainty which I had always hoped to find in mathematics was lost in a bewildering maze. All this would have made me sad but for the fact that the ascetic mood had begun to fade. It had had so strong a hold upon me that Dante's *Vita Nuova* appeared to me psychologically quite natural, and its strange symbolism appealed to me as emotionally satisfying. But this mood began to pass, and was finally dispelled by the First World War.

One effect of that War was to make it impossible for me to go on living in a world of abstraction. I used to watch young men embarking in troop trains to be slaughtered on the Somme because generals were stupid. I felt an aching compassion for these young men, and found myself united to the actual world in a strange marriage of pain. All the high-flown thoughts that I had had about the abstract world of ideas seemed to me thin and rather trivial in view of the vast suffering that surrounded me. The non-human world remained as an occasional refuge, but not as a country in which to build one's permanent habitation.

In this change of mood, something was lost, though something also was gained. What was lost was the hope of finding perfection and finality and certainty. What was gained was a new submission to some truths which were to me repugnant. My abandonment of former beliefs was, however, never complete. Some things remained with me, and still remain: I still think that truth depends upon a relation to fact, and that facts in general are non-human; I still think that man is cosmically unimportant, and that a Being, if there were one, who could view the universe impartially, without the bias of *here* and *now*, would hardly mention man, except perhaps in a footnote near the end of the volume; but I no longer have

the wish to thrust out human elements from regions where they belong; I have no longer the feeling that intellect is superior to sense, and that only Plato's world of ideas gives access to the 'real' world. I used to think of sense, and of thought which is built on sense, as a prison from which we can be freed by thought which is emancipated from sense. I now have no such feelings. I think of sense, and of thoughts built on sense, as windows, not as prison bars. I think that we can, however imperfectly, mirror the world, like Leibniz's monads; and I think it is the duty of the philosopher to make himself as undistorting a mirror as he can. But it is also his duty to recognize such distortions as are inevitable from our very nature. Of these, the most fundamental is that we view the world from the point of view of the *here* and *now*, not with that large impartiality which theists attribute to the Deity. To achieve such impartiality is impossible for us, but we can travel a certain distance towards it. To show the road to this end is the supreme duty of the philosopher.

## THE SIGNIFICANCE OF THE ST. LAWRENCE SEAWAY\*

*H. C. Brockel*

### I

THE LESSON taught by the history of the St. Lawrence Seaway can be summed up in a single phrase: the emergence of regional unity from disunity. To show how this concept developed, we have to go back to the history of the Great Lakes region, and we have to begin with the realization that this area has been the home of rugged individualism carried to unusual extremes. It has been the home of uninhibited free enterprise, with a maximum of opportunity for private enterprise and a minimum of regulation and interference. It was in this atmosphere that the steel industry and its related industrial empires grew on the shores of the Great Lakes. Now, looking at the map, one would say that this is a region which would find unity inescapable; and yet we have succeeded in escaping it for a century. On the shores of these lakes we found, in almost unlimited quantity, the three basic raw materials of steel. There was coal in Ohio, Pennsylvania, West Virginia, Illinois; upper Michigan, as most of you know, is a solid mass of limestone, like most of northern Wisconsin; and to the west of these two mineral phenomena we unearthed the world's richest and most accessible deposits of iron ore. Nature wasn't satisfied to give us these three resources in such tremendous profusion; she went on to tie them together with the world's cheapest highway of water

\* This paper was part of a panel discussion on "The St. Lawrence Seaway: A New Dimension in Canadian-American Relations," held at Michigan State University as the first of three annual Canadian-American Seminars in February.

transportation. And that was the physical opportunity which the region had for developing an economic unity.

Actually the region *is* an economic unit, but it has usually managed somehow to avoid admitting that fact. I refer, for example, to the fact that Chicago is forever at odds with the rest of the Great Lakes, politically and from the standpoint of local personalities; and, of course, to the fact that Chicago water diversion acts perpetually as the thorn under the saddle of the rest of the region. Duluth had no particular concern with the thinking of people on Lake Erie; Milwaukee cared very little about Buffalo's problems; and Buffalo cared less about ours. The result was that industry grew somewhat like Topsy. The steel industry planted itself upon the shores of Lake Erie, and later on Lake Michigan. It drew freely upon the iron ore, the coal, and the limestone. It utilized the Great Lakes to tie together these raw materials and to build this enormous industrial empire.

Yet, in so doing, the region succeeded always in escaping a sense of political and economic unity. There never was a Great Lakes bloc in Congress; there is not a Great Lakes bloc in Congress today. By a series of events which we will develop, the Seaway finally was maneuvered through our Congress, but that having been accomplished, and certain other corollary programs put in motion, each of our Senators and Congressmen went happily on his individual way without any particular realization that a great new force was at work in the region. That is not true of all of them, but I think it is true of the large majority of our Congressional representatives from the Great Lakes region. We have had political unity and we have had economic unity, but only through accident. The result was that the St. Lawrence Seaway project was born in bitter controversy.

The Great Lakes region was itself divided very sharply on this issue. In the late 1930's and the early 1940's, one found the support for the Seaway movement centered in Duluth,

Milwaukee, Muskegon, and Detroit. And, in looking back, one can better understand our ineffectiveness in Congress when it is realized that Buffalo, Cleveland, Chicago, and Toledo were working as hard against the Seaway in Washington as the other four cities were working for it. The result was that Ohio developed a considerable hostility to the Seaway project; Chicago, goaded by the Chicago Association of Commerce and conjoined with tremendous railroad and financial influence, was almost solidly against the project. Wisconsin, Minnesota, and Michigan pretty much stood alone; in fact, I would venture to say that if an automobile had been carrying the right combination of four or five people at certain times in 1942 or 1943, and if that automobile had met a railroad train on a grade crossing, the Seaway movement would have come to a fragmented and inglorious death. But somehow there were always a few voices, and there were always a few Congressmen ready to put in new Seaway bills.

The movement was given credit for much more force than it actually possessed, and I think the issue was resolved for us—this is most important—through two events: first, the steel industry's belated realization that the Mesabi Range did have a determinable life span; and, second, the dramatic development or discovery of huge and rich ore bodies in eastern Canada, in Labrador, and on the eastern borders of Quebec. The steel industry had gone along on the blithe assumption that Mesabi would be producing ore as long as the steel mills were rolling out ingots. But already in 1943 a few of us in the Seaway movement began to send up the first trial balloons about the Seaway's having taken on new importance because of the very heavy World War II drain on Mesabi ore and the discoveries in Canada. Thinking that we were doing a service to the Lake region, we attempted to launch some consideration of this critical problem of raw material for the industry, pointing out that steel was the

basic factor in the economy of the Great Lakes region, with some 90 per cent of American steel production centered in the basin, and with most of the satellite cities of steel clustered around the basin. If you take any one of fifty or sixty secondary cities in Wisconsin, Michigan, Iowa, or Illinois, you will find that they are outposts of steel, collections of craftsmen and industry, all engaged in processing iron and steel. When we shake down the structure of our industry, we find it is basically an iron and steel complex, with many variations of it, but we always come back to that fundamental—that we are a region of iron workers.

One would believe that this great industry, with its tremendous resources of money and manpower and research, would have been more alert to this raw material problem. But it proved not to be. As a matter of fact, if you were to go to a certain issue of *Harper's* magazine in 1945, you would find an essay by a top executive of a Great Lakes steel enterprise ridiculing the alarms that were being circulated concerning the long-range raw material problem of steel, mostly in terms of iron ore, with lesser implications in terms of manganese and alloys. But in 1952, I had the special pleasure of hearing this same prophet plead with a Senate committee to please build the St. Lawrence Seaway because the industry could not survive without deep-water access to the ore bodies of eastern Canada, and to other alloys and ores from overseas sources. Even now plans are under way, for example, to bring chrome and manganese and certain blending ores from Africa and South America and other parts of the world into the Great Lakes basin. The public has seemed more aware of the steel supply problem than have the leaders of the industry itself.

## II

Once that realization came home, however, the industry did mobilize its resources. It threw money into the fight for the



Seaway, although, incredibly enough, it had previously been throwing money into the fight *against* it. But there still was the alliance between eastern steel mills, the Lake Carriers Association, utilities, and eastern railroads with which to contend. They had closely interlocking financial structures and corporate structures. The point of view of these eastern banks and eastern railroads was transferred to the industrial empires on the shores of the Great Lakes. So those of us who believed in the Seaway not only had to win a regional victory over the natural and understandable opposition of eastern ports and Gulf coast ports to an important new trade route which might bypass some of the established trade routes; we also had the bitter opposition of the eastern trunkline railroads which, like most railroads, try to eliminate or dry up water-borne commerce on routes paralleling the major railroad lines. The economic struggle was, of course, translated into a political struggle against the powerful blocs which opposed the Seaway all along the Atlantic Seaboard and along the Gulf. The Far West was indifferent. There was reasonably good understanding and support from the agricultural states of the Middle West and from a few cities which had a port consciousness, including the four I have mentioned. These had some foreign-trade consciousness, some awareness, that their competitive position might be improved if they were to have access to the advantages of a direct trade route to overseas markets and the corollary advantages of an import route for essential raw materials or consumer goods coming from overseas.

That, in brief, is the background against which Congress had to weigh the Seaway at intervals from 1917 until 1954. An interesting fact, however, is that the project was never rejected by Congress outright. Every time a setback was suffered, it was always in the form of a recommittal of the bills to committees for further study, that time-honored method of getting rid of a project without definitely squelching it, or



some other parliamentary maneuver. I suppose historically this might give us some comfort—the feeling that even the opponents may have sensed dimly that there was an underlying merit to this project and a great economic impetus behind it. I suppose, too, that the political scientists of this country will be studying this project for the next hundred years, because no proposal has been more articulately argued; the literature on it is tremendous, the debates in Congress were endless, and the best minds in the country on both sides were frequently engaged in it.

But, to come back to my basic point, the Seaway struggle was finally resolved by two events. The steel industry decided that it *was* running out of raw material and that it *did* want access to the tremendous deposits of eastern Canada, and to certain important secondary deposits in Canada, such as Steep Rock and several others which are in the preliminary stages of development. Secondly, the Canadians, who have a highly developed export consciousness, realized that here was a great new resource, marketable readily in the United States in close proximity to Canadian borders, and that it could be and would be an important element in Canada's ability to earn a dollar supply which could sustain her demands on the American market, mostly in the fields of heavy industrial equipment and machinery. The Canadian decision was much more quickly translated into action than was ours. In 1952, the Canadian Parliament, by a unanimous vote, created a St. Lawrence Seaway Authority, empowered it to proceed with the building of the project, gave it considerable latitude as to whether the project should or should not be self-liquidating, and, at the same time, served notice on our government in the firmest tones that while Canada would welcome our participation, the Seaway would be built, with or without us. In other words, the Canadian recognition that the St. Lawrence-Great Lakes system is indeed the economic lifeline of Canada came into play again.

To the Canadians, this is not a new undertaking. Canada has been progressively developing the Seaway since the first primitive canals and locks were built to carry the bateaux of the fur traders around the Lachine Rapids, and that happened as long ago as the 17th century. Canada persistently continued to pick away at this job of improving this water course from the middle 1600's until 1933, when she put the tremendous Welland Canal into service to take shipping around Niagara Falls. That was one of the great historic developments in the perfection of this route. So, what to us was a difficult and unpalatable decision involving regional and political considerations and competitions, was to the Canadians a much simpler proposition.

I think that this is important to understand, because the Canadian viewpoint on the Seaway and the American viewpoint on the Seaway are two quite different animals. To one country it was a difficult, controversial, competitive decision to make, while to the other it was a natural step forward, and I don't think in the Canadian mind it is the end of the St. Lawrence Seaway story at all. We are moving, in this development, from a 14-foot channel with the most primitive small locks and facilities to a quite usable 27-foot project which will accommodate about 80 per cent of the world's shipping. But I am sure that in the minds of the Canadians and those Americans who have vision, we look forward, ultimately, to a 30-foot waterway, and, later on, possibly to 35 and even 40 feet, if the economics of world shipping demand that, and if the resources and the transportation demands of the two countries continue to grow.

### III

The glamor of the Seaway in the Middle West seems to lie in the overseas trade. In Milwaukee, for example, we recently announced a new ocean service by the Norwegian-American Line; Cunard and several other large shipping companies are

publicizing the extension of ocean service to Lake Michigan. We have seven major American steamship lines with applications pending before the Maritime Administration for subsidized American flag service into the Great Lakes. By 1961 or 1962, if all the present programs materialize, about forty of the world's greatest shipping enterprises will regularly schedule ships out into the Great Lakes. The Dutch are building two very modern combination freighter and passenger liners for the Lake Michigan trade, if you please—very handsome ships with accommodations for 100 people; and on drawing boards all over the world new ships are being designed for this trade. The Grace Line has six C-2's, the most modern utility-type of ocean freighter under the American flag, ready and waiting for Maritime Commission approval to come into the Great Lakes to serve the South American trade.

So the sex appeal of the Seaway seems to lie in the overseas trade. That is quite understandable, because coffee from South America, rubber from Malaya, and copper from Chile, have a more romantic connotation than, let us say, newsprint from Three Rivers, Quebec, or iron ore from Sept Isles, the new iron ore loading port on the north bank of the St. Lawrence. Certainly the St. Lawrence will do a tremendous job of serving the overseas trade of the Middle West and of the entire mid-continent region; it will give us cheaper access to many badly needed raw materials from South America and Africa and the Far East; it will bring us consumer goods and some of the fine things of life from Europe. But to me its basic, day-to-day job will be in moving cargoes between the United States and Canada; these will make up the major volume of shipping on the Seaway. I think that in this extension of the Great Lakes shipping down to eastern Canada, with the economies of these huge ships (already the most efficient in the world, they are being built bigger all the time to achieve even greater efficiency), we have really two trans-

portation developments wrapped up in the Seaway. The Great Lakes now become a sort of new Mediterranean, open to the ships of all the world which have legitimate commerce to do with us; and, for the first time, the huge fleets of the Great Lakes and the huge commerce of the Great Lakes can break past the traditional barriers at the eastern end of Lake Ontario and move freely down to Toronto and Hamilton and Montreal and Quebec.

Because of the interdependence of the United States and Canada, I visualize and believe earnestly that the biggest transportation job the Seaway has to do is to serve this economic interdependence of these two nations. Basic to that belief is the unhappy realization that the United States today—let us face it candidly—is a have-not nation. I do not intend to turn these remarks into the familiar conservation lecture, but we have been very prodigal with our resources. Only sixty years ago the greatest stand of white pine that the world has ever seen covered the region where we are tonight. Today tourists drive a hundred miles to see a virgin tree in northern Wisconsin and Michigan. It is no small accomplishment, I think, for only two generations to slash to the point of disappearance the world's greatest stand of marketable wood. And that leads us to Canada, because she still has her forest cover. She is our principal supplier of paper products. Practically every newspaper printed in the Great Lakes region, and up and down the Seaboard, is printed on Canadian newsprint. That is one homely example of this interdependence. The steel industry, particularly, will look to Canada for an increasing volume of iron ore, principally, I believe, from the Ungava Range in eastern Quebec and Labrador. It is a rich ore body and its limits are being enlarged every day by exploration. The iron content is much higher than that of Mesabi's—fewer tons of ore will do the same job. The forecast for our steel industry, which has had practically all of its eggs in the Mesabi basket, is a sharply

reduced utilization of Mesabi ore; a slowly accelerating utilization of taconite from the Lake Superior region, which is still a very costly supplement; an increasing flow from Steep Rock on the north shore of Lake Superior; and a very large volume from eastern Canada, with alloys, manganese, and mixing ores coming in from South America, Cuba, and Africa.

Thus, the Great Lakes steel industry is being internationalized on a tremendous and inescapable scale. In fact, we were very much criticized for the dimensions of the new Seaway, for certain lock dimensions, and so on, because one of the principal Great Lakes iron ore users was building ships of fantastic size in Japan, with such length and beam that they could not navigate the new Seaway. But any ship now on the Great Lakes or building—and there are some very large ships being built—will navigate this route safely and speedily, and some 80 per cent of world shipping will be able to navigate this route, so that the problems of raw materials supply for industry in the interior will be resolved to a very large degree by the opening of the Seaway.

I cannot resist throwing out three startling statistical comparisons on Canada. The 17 million Canadians are only an infinitesimal fraction of the 2 billion-plus people in the world, but they constitute the world's fourth largest trading nation. That's one statistic to remember. Number two: these 17 million Canadians have the largest per capita foreign trade of any nation in the world. Number three: each of us is the other's largest customer; each of us is the other's largest supplier. That is a unique relationship, a unique dimension. And, of course, we have other factors making for interdependence—continental defense, for example. We have a common heritage of Anglo-Saxon tradition and law; and we may be the last citadels for defense of Western civilization as we know it today. So there is an integration of Canadian raw materials not only in our industrial complex, but with the very vital factors of continental security. We could not exist

very long in another major conflict without the use of Canadian resources on a tremendous scale.

Another factor tending toward unity is that the St. Lawrence Seaway is going to be a powerful force in dispelling what we like to call mid-western isolationism. Milwaukee, I think, was about as isolated a city and as insulated a city as one would find in the region. Yet, in a period of two or three months, this fall and winter, we were visited by the ambassadors of ten leading world powers. We have the pleasure of frequent contact with the trade commissioners and the Consuls-General of many nations. Recently, when a spectacular new shopping center was dedicated to the theme of international trade and friendship, lo and behold—fifteen nations sent their representatives to the dedication. Of course, it is not because they had an interest in the shopping center *per se*; but it was symbolic of the new position which the Middle West now holds in world affairs. This region is being traversed frequently by the executive officers of some of the world's great shipping companies, by economists, and by the trade attaches of many governments. It has become, in fact, very significant in world affairs. That significance, I think, is best exemplified by the fact that the Queen of Canada, who happens also to be the Queen of the British Empire, will travel the ocean and the river this year to dedicate this waterway. I think that the fact that a queen, a president, and a prime minister of the great nation to the north will join in the dedication is much more than window dressing or good public relations. I think it is a deep and significant symbol that the Great Lakes region, its skills, its industries, its crafts, its foreign trade production, and its import potential, have achieved a real meaning in the world today.

## MUSIC AND THE ANALOGUE OF FEELING: NOTES ON ELIOT AND BEETHOVEN<sup>1</sup>

*Harvey Gross*

ARTISTIC PRACTICE and critical speculation in the 19th century effected close connections between music and literature. From Schumann to Mahler, composers wrote program music or music with distinct literary affinities. Mallarmé in France and Whitman in America were forging new prosodies out of a "language, retempered and purified by the flight of song."<sup>2</sup> Pater formulated his doctrine that *all art constantly aspires toward the condition of music*. Although neither Pater nor Mallarmé propounded any substantial aesthetic theory—Pater is prophetic but scarcely explanatory, while Mallarmé has a precise way of almost saying something—those interested in searching the grounds of comparison between poetry and music can find much that is provocative in their scattered ideas.

Pater believed that the essence of poetry is in "an inventive handling of rhythmical language," and that music represents an art in which form and idea are perfectly mingled. In music form *is* idea, and poetry is excellent as it approaches the purity of music. Agreeing with Pater, Mallarmé also sees music as the norm for an ideal poetry in which the distinction between form and idea would be obliterated. More impor-

<sup>1</sup> A shorter version of this paper was read before members of the Modern Language Association at its annual convention, December 27, 1958. I wish to acknowledge the help of Professor Jan La Rue of New York University. Many of his ideas have been incorporated in this paper, and his stimulating interest has made me aware of the possibilities inherent in this subject.

<sup>2</sup> Stéphane Mallarmé, *Selected Prose Poems, Essays, and Letters*, translated by Bradford Cook (Baltimore: The Johns Hopkins Press, 1956), p. 49.



tantly, Mallarmé recognized that the music of poetry is not "the elemental sound of brasses, strings, or wood-winds, but the intellectual and written word in all its glory—music of perfect fulness and clarity, the totality of universal relationships."<sup>3</sup> The music of poetry is not a matter of sound effects. Alliteration or such pseudo-onomatopoeia as "Forlorn! the very word is like a bell" is not the essential music of poetry: it lies in "the totality of universal relationships."

These relationships are established and articulated in the structures of language; the significant music of poetry is heard in the forms of grammar, the order of words, and the patterns of stress and quantity. Syntax, the order of words as they arrange themselves into patterns of meaning, is the analogue to harmony in music. Like harmony, syntax generates tension and relaxation, the feelings of expectation and fulfillment which make up the dynamics of poetic life. As Susanne Langer puts it:

The tension which music achieves through dissonance, and the reorientation in each new resolution to harmony, find their equivalents in the suspensions and periodic decisions of propositional sense in poetry. Literal sense, not euphony, is the 'harmonic structure' of poetry; word melody in literature is more akin to tone-color in music.<sup>4</sup>

Syntax gives us the arc of "propositional sense," the articulations of meaning. Like harmony in music, syntax makes connections, strengthens ideas, and relates thematic material.

Closely related to syntax, and sometimes inseparable from it, is prosody. I identify, perhaps arbitrarily, a poet's prosody with his metrics. While there are probably non-metrical prosodies (Blake in the *Prophetic Books* and Whitman in many poems), meter commonly defines a poet's prosody. Meter in poetry has, of course, its counterpart in music. The connections between musical and poetic meter are often

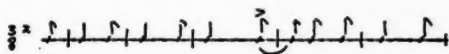
<sup>3</sup> Mallarmé, *op. cit.*, p. 42.

<sup>4</sup> Susanne K. Langer, *Philosophy in a New Key* (Cambridge, 1942), p. 261.



obvious, though the failure of prosodists to successfully adapt musical notation for scanning English verse indicates many thorny problems. On the whole, however, there exists an easy commerce between the musical theorists and the prosodists. It makes sense to talk of the dactylic movement in the scherzo of Beethoven's Ninth Symphony; it makes equally good sense to recognize the fourth foot here as syncopated:

To be or not to be—that is the question.



Meter in poetry and measure in music have similar and familiar functions: like syntax and harmony, they create expectation and promise fulfillment. In poetry, meter and its variations are involved with referential meanings; metrical uniformity or irregularity serves to stress, suspend, and sometimes demolish "propositional sense."

An examination of syntax and prosody demonstrates basic relationships between poetry and music. Such an examination is more than an account of certain musical techniques used in poetry. These techniques may be consciously or unconsciously employed. In certain poems the development of thematic material parallels sonata or fugue form. We can also find in poetry such devices as diminution and augmentation, ostinato effects, and inversion. But the deepest affinities between the arts of poetry and music lie at yet an unexamined level—where the basic musical and poetic discourse can be expressed in such terms as tension, ambiguity, expectation, and fulfillment. At this level spiritual affinities between certain musical works and poems prove more than fanciful recognitions.

## II

Eliot had been using musical techniques long before he composed *Four Quartets*. *The Waste Land* was an experiment in

the use of repeated thematic material as well as being orchestral in its elaborate handling of contrasting sonorities. Eliot's method in the *Quartets* is more formally musical: in addition to handling his material thematically, he employs the devices of theme and variation, inversion, and diminution. He uses a five movement form where long sections of philosophic density are contrasted to shorter lyrical sections. The first movement of each *Quartet* develops a pair of themes in what can be roughly called sonata form. If *The Waste Land* is orchestral, designed for public hearing in a large hall, the *Four Quartets* are chamber music and must be heard in a small room.

But Eliot goes beyond the techniques of musical composition. He does a job of transmutation, of reproducing in the articulations of language the articulations of music. Through a deliberate and idiosyncratic use of syntax, Eliot gives us qualities common to both music and poetry—the feelings of arrest and motion, of beginnings and endings, of striving and stillness. This use of syntax is so much Eliot's own that I feel the "Eliotic style" is formed on it.

The syntax of Eliot's lines in *Burnt Norton* is a musical arrangement:

Time present and time past  
Are both perhaps present in time future,  
And time future contained in time past.  
If all time is eternally present  
All time is unredeemable.  
What might have been is an abstraction  
Remaining a perpetual possibility  
Only in a world of speculation.  
What might have been and what has been  
Point to one end, which is always present.<sup>5</sup>

We hear the echoing repetitions of individual words and phrases; we hear the more subtle repetitions of syntactical

<sup>5</sup> From *Four Quartets*, copyright, 1943, by T. S. Eliot. Reprinted by permission of Harcourt, Brace and Company, Inc.

structure, the persistently unvarying grammatical forms. The syntax is static: the noun *Time*, the modifiers *past*, *present*, *future*, the copulatives *is* or *are*, all follow in strict order. Grammar is repeated in a way that makes us realize syntax is working as harmonic structures work in music: to produce tension and relaxation, the very curve of feeling. We hear how propositional sense is modified by each repetition of word and phrase; we also hear how the repetitions of syntax produce musical meaning.

Note the grammatical marking-time in these lines: "If all time is eternally present/ All time is unredeemable." Eliot tells us how time can be immovable, without direction. But there is a point where Eliot must resolve his meaning, where a composer would introduce a cadence to tell us where his music is going, harmonically speaking. Then Eliot changes his syntax; he drops the copulatives and allows the movement of the preceding lines to pivot on the active verb *point*: "What might have been and what has been/ Point to one end, which is always present." Eliot has suspended syntactical movement by using only the verbs *is* and *are* for nine lines running. The verb *point* releases us into a new idea, and we modulate into a new syntactical unit:

Footfalls echo in the memory  
Down the passage which we did not take  
Towards the door we never opened  
Into the rose-garden. My words echo  
Thus, in your mind.<sup>6</sup>

Here the verbs are active; the repeated *echo* emphasizes the music of "Footfalls echo in the memory . . . My words echo/ Thus, in your mind." The same music is heard, a haunting syntactical melody, as it were: "Down the passage . . . Towards the door . . . Into the rose-garden. . ."

Another kind of music is heard in the lyrical fourth section of *Burnt Norton*:

<sup>6</sup> *Ibid.*

Time and the bell have buried the day,  
 The black cloud carries the sun away.  
 Will the sunflower turn to us, will the clematis  
 Stray down, bend to us; tendril and spray  
 Clutch and cling?  
 Chill  
 Fingers of yew be curled  
 Down on us? After the kingfisher's wing  
 Has answered light to light, and is silent, the light is still  
 At the still point of the turning world.<sup>7</sup>

We hear the insistent repetitions as in the first section: "turn to us . . . bend to us . . . Down on us." These are the melodies. We have, however, an effect which, to quote Mrs. Langer again, involves "the suspense of literal meaning by a sustained ambiguity resolved in a long-awaited key word."<sup>8</sup> Reading the penultimate line, we briefly poise on the word *still*. Since the usual tendency is to pause slightly at the end of the line, the mind first understands *still* as an adjective modifying *light*. When we complete our reading, we understand that *still* is more exactly an adverb whose effect is strong enough to modify the sense of both lines. The light is *even yet* at the still point of the turning world.

We realize the ambiguity here, and how the word functions as a grammatical pivot on which the movement and meaning of the lines turn. The effect is exactly like an ambiguous harmonic structure which hovers between tonalities, a structure which might take any of a number of possible directions, but which is suddenly resolved by an unexpected cadence.

We note in *East Coker* another effect of harmony which might be called "the illusion of tonality." The poem opens in this "key":

In my beginning is my end. In succession  
 Houses rise and fall, crumble, are extended,  
 Are removed, destroyed, restored, or in their place  
 Is an open field, or a factory, or a by-pass.<sup>9</sup>

<sup>7</sup> *Ibid.*

<sup>8</sup> *Ibid.*, p. 261.

<sup>9</sup> *Ibid.*

At the end of the first section we have:

Dawn points, and another day  
Prepares for heat and silence. Out at sea the dawn wind  
Wrinkles and slides. I am here  
Or there, or elsewhere. In my beginning.<sup>10</sup>

Again Eliot builds tension through repeated syntax: "... or in their place ... or a factory ... or a by-pass." This syntactical pattern is repeated, in diminution, just before Eliot restates his theme: "I am here/ Or there, or elsewhere. In my beginning." The familiar, almost expected, syntax acts as a return section, preparing us for the new entrance of the theme in its proper "tonality." We stress this musical preparation through syntax. Many have recognized Eliot's use of repeated thematic material without realizing how complex Eliot's musical procedures actually are. At the end of *East Coker* we hear the same broken, hesitant syntax announcing the return of the theme, in inversion:

The wave cry, the wind cry, the vast waters  
Of the petrel and the porpoise. In my end is my beginning.




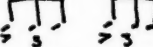
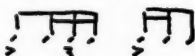
The striking effect created by each return of the theme is not achieved through simple verbal repetition or even through verbal modifications. It is achieved through the manipulation of syntax which gives this "illusion of tonality." Eliot's procedure parallels sonata form where the principal tonality is re-established at the end of a movement, and the main theme makes its final appearance.


The musical qualities of Eliot's syntax are reinforced by the prosody. Like syntax, prosody is responsible for the movement of words and contributes toward the dynamics of feeling. More than syntax, prosody produces affective states below the level of explicit meaning. Syntax is concerned with literal sense, but prosody retards, speeds up, or emphasizes literal sense by directly physical means. A particular rhythm may

<sup>10</sup> *Ibid.*

communicate an emotion far more vividly than a statement about that emotion.

I distinguish between rhythmic effects and basic metrical patterns in the *Quartets*. These rhythmic effects occur within the context of a formal metric; however, the ordinary symbols of scansion—which can adequately outline meter—do not reveal the more subtly musical aspects of Eliot's rhythms. By applying some of the methods of musical analysis, we can hear how Eliot develops a rhythmic idea, and how through rhythmic expansion, an idea accumulates emotional power. If we assign note-values to Eliot's word groups, we get something like this:<sup>11</sup>

time present	
time past	
time future	
time is eternally	
time is unredeemable	

The rhythm () is speeded-up as the idea evolves and emotion intensifies. The rhythm persists in our memories, modifying meaning and feeling: as the units of the phrase quicken and expand, we feel the arc of "propositional sense" tighten. The rather slack statements about the nature of time in the first three lines are followed by the taut proposition of lines four and five: "If all time is eternally present,/ All time is unredeemable." This is awesome; the notion challenges the imagination. We accept the opening statements as curious or teasing, the speculations of a poet with a taste for conundrums. But lines four and five have accumulated the

<sup>11</sup> My notation of the rhythms may be compared with Eliot's reading on H.M.V. Record C. 3598. Any attempt to note precisely a particular reading is necessarily mechanical. What I wish to show is the changes in tempo and movement. This can be done only by musical notation.

tension (through repeated syntax as well as rhythmic expansion) appropriate to the idea: that everything we have done is still *doing*, that everything we *shall do* is already taking place. Metaphysics is implicit in the paradigms of verbs: the possibilities of human action (what might have been; what has been) are conjugated in Eliot's syntax. And all grows to thought in the expanding rhythms of Eliot's language.

The formal prosody of *Four Quartets* is extremely varied, yet Eliot maintains an overall consistency in metrical tone. Eliot allows a contrasting metric to beat against the basic iambic meter of English speech. The opening of *Little Gidding* provides a good example of this:

Midwinter spring is its own season  
 Sempiternal though sodden towards sundown,  
 Suspended in time, between pole and tropic.  
 When the short day is brightest, with frost and fire,  
 The brief sun flames the ice, on pond and ditches,  
 In windless cold that is the heart's heat,  
 Reflecting in a watery mirror  
 A glare that is blindness in early afternoon.<sup>12</sup>

Eliot is writing a four-stress alliterative line, not unlike the line of *Piers Plowman*. Despite the thumping consonants and the hesitation of each caesura, Eliot keeps a sense of iambic movement. At least one of the lines can be scanned, without undue equivocation, as blank verse: "The bríef sun flames the íce on poínd and díches." The opening of *The Dry Salvages* moves in almost regular trisyllabic feet, anapests and dactyls; but there is none of the solemn torpor of *Evangeline* or the galloping boredom of *The Destruction of Sennacherib*:

I do not know much about gods; but I think that the river  
 Is a strong brown god—sullen, untamed and intractable,  
 Patient to some degree, at first recognised as a frontier;  
 Useful, untrustworthy, as a conveyer of commerce;  
 Then only a problem confronting the builder of bridges.<sup>13</sup>

<sup>12</sup> *Ibid.*<sup>13</sup> *Ibid.*



Each line has five principal stresses and a strongly felt caesura; the meter is anapestic pentameter with dactylic and spondaic substitutions. But the ear does not hear anapests and dactyls; it hears the slow and primitive music of the Mississippi as it flows through past and present, recalling Eliot to childhood memories. What the ear hears are the inflections of the human voice, the infinitely subtle music of feeling.

### III

Further analysis would show more precisely the musicality of *Four Quartets*. The point I wish to establish is that Eliot, through syntax and prosody, evokes a complexity of feeling in ways that music evokes analogous states in the minds of sensitive listeners. Eliot is attempting to extend the limitations of language by entering the domain of another art. He uses syntax and prosody like music to enlarge the available means of expression. But he is not approaching the condition of music because he wishes to lose his ideas in his form, or to create mere patterns of pleasing sounds. He is straining to evoke states of consciousness which cannot be expressed by the purely cognitive aspects of language.

Beethoven struggled with the reverse of this problem: the inability of purely instrumental music to express specific ideas. The finale of the Ninth Symphony begins with a recapitulation of all the abstractly musical possibilities of the preceding three movements. These are rejected, and we hear the double-basses struggling to become articulate, to transform the forms of feelings into the forms of statements. Beethoven has to supplement his instruments with human speech, and the baritone cries—as if he knows that the unaided orchestra could not tell us what Beethoven means to tell us—“*O Freunde, nicht diese Töne!*” Music itself for Beethoven was not enough, as poetry was not enough for Eliot:

Words strain,  
Crack and sometimes break, under the burden,  
Under the tension, slip, slide, perish,  
Decay with imprecision, will not stay in place,  
Will not stay still.<sup>14</sup>

But there is stillness in the movement of music; for in music there is no concern with the burden of cognition, of fixing meanings in place. Rather, as Mrs. Langer eloquently puts it:

The imagination that responds to music is personal and associative and logical, tinged with affect, tinged with bodily rhythm, tinged with dream, but *concerned* with a wealth of formulations for its wealth of wordless knowledge, its whole knowledge of emotional and organic experience, of vital impulse, balance, conflict, the *ways* of living and dying and feeling. Because no assignment of meaning is conventional, none is permanent beyond the sound that passes; yet the brief association was a flash of understanding. The lasting effect is, like the first effect of speech on the development of the mind, to *make things conceivable* rather than to store up propositions. Not communication but insight is the gift of music; in a very naive phrase, a knowledge of 'how feelings go.'<sup>15</sup>

The significance of music is "with the ways of living and dying and feeling"; its meaning is "a knowledge of how feelings go." Music, Mrs. Langer continues, is a real semantic: a language which has no fixed signs, but which has a syntax of feeling as the language of words has the logical forms which relate the parts of speech. To clinch Mrs. Langer's argument, I quote from J. W. N. Sullivan. Sullivan's remarks on significance in music clearly anticipate her chapter in *Philosophy in a New Key*. Here Sullivan is commenting on music as an expressive language, capable of rendering states of consciousness:

Beethoven most certainly regarded his music as expressing states of consciousness which might conceivably have been

<sup>14</sup> From *Burnt Norton*, *loc. cit.*

<sup>15</sup> Langer, *op. cit.*, p. 244.

expressed by some other art. Indeed, he seems to have regarded music not only as a medium for the presentation of 'beauty,' but as a language with which he was more familiar than any other. . . . Beethoven . . . considered that his music had an extra-musical content, that is to say, a content that could be . . . expressed in some other medium. . . . Music, as an expressive art, evokes states of consciousness in the hearer which are analogous to states that may be produced by extra-musical means.<sup>16</sup>

Like Mrs. Langer, Sullivan denies that the meaning of music lies within a context of purely abstract musical relationships; he believes that music refers to the human world of gesture, action, and feeling.

We can test this theory against our own experience with a musical work. In listening to the *Pastoral Symphony*, we do not experience nature; nor do we necessarily form mental images of the walk in the country, the flowing brook, or the shepherd playing on his flute. The bucolic opening theme of the symphony is bucolic only if we want to think it so. The significance of this music lies in the complex emotional states which the melody induces: feelings of undisturbed ease, relaxation, quiet movement punctuated by periods of rest. We might possibly have exactly these feelings when we walk in the country; most of us will have similar ones.

There is, however, no direct correspondence between music and the emotions; nor is music itself emotion. Music is an analogue to feeling in the same way that words symbolize objects and abstractions. Words are arbitrary designations; there is nothing in the word *apple* that is intrinsically apple-like. Music is also an arbitrary designation, not for objects or ideas but for feelings. Thus Mrs. Langer uses the term *symbolic* to describe the way music communicates its content of emotion, and she argues that the structures of music are indeed *symbolic forms*. She is arguing against the notion that

<sup>16</sup> J. W. N. Sullivan, *Beethoven: His Spiritual Development* (New York: Mentor, 1949), pp. 32-33.

music is a set of emotional signs: a woman's cry over a sick child, a drowning man's cry for help. Under these conditions the designation of emotion requires a particular action: sympathy for the woman, rescue for the man.

Music requires no action on the listener's part. The *Marcia Funebre* of the *Eroica* tells of grief and consolation, but we need console no mourners nor show any sympathy. We apprehend grief in its deepest and most painful aspects; we know more about grief than language could possibly communicate. We are allowed to experience not this particular grief and that actual sorrow: we are given a universal knowledge "of how grief goes."

#### IV

Eliot uses his poetic resources in ways that music operates: to give us the knowledge of how certain feelings "go." In a real sense we have a musical experience when we read, or better yet, listen to Eliot read, the *Quartets*. We might ask now whether we can find analogues to Eliot's world of feeling in a particular musical work. Can we demonstrate spiritual affinities between the quartets of Eliot and those last quartets of Beethoven, from which Eliot seems to derive "his title, much of his form, elements of his tone and content"?<sup>17</sup> Can we demonstrate that such affinities are more than "literary" recognitions made in the mind of a poetizing listener?

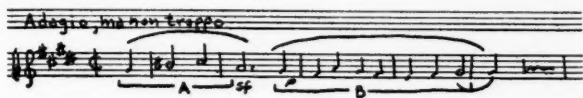
A description of certain sections of Beethoven's Quartet in C# Minor, Op. 131, may suggest what Eliot heard in Beethoven. My selection of this quartet is arbitrary: the same points can be made by examining the Quartet in B Flat, Op. 130, or the Quartet in A Minor, Op. 132. Eliot was certainly not influenced by a specific musical work, and we cannot find

<sup>17</sup> I quote here from *Time*, June 7, 1943. The Beethoven-Eliot parallels have been recognized by many, including Stephen Spender, Stanley Edgar Hyman, and more recently, by Herbert Howarth. See Herbert Howarth, "Eliot, Beethoven, and J. W. N. Sullivan," *Comparative Literature*, IX, 4 (Fall, 1957), 322-332.

literal resemblances. Rather, the musical gestures of Beethoven's late quartets evoke responses relevant to Eliot's poetry: we respond to ambiguity, surprise, contradiction, unexpected delay; we experience a world of stress, of exultation, of resignation, and final affirmation. I choose the Quartet in C# Minor because of its great variety in mood and technical effect, and because its vast musical scheme offers a rich context of contrasting feeling.

The deepest affinity between Beethoven and Eliot is that the Quartet in C# Minor and the *Four Quartets* are cyclical structures; they develop organically out of a single controlling idea. In the C# Minor Quartet everything starts with the opening fugue and its seminal motto, G#, B#, C#, A. From these notes Beethoven builds a musical structure in which all elements are closely unified; in which technical device serves the expression of a single spiritual fact. Each of the *Four Quartets* elaborates a central theme; each radiates out from a proposition on the nature of time, on the meaning of history, on the flow of the great river, and on the paradox of the seasons. These themes are finally resolved in the last *Quartet*, *Little Gidding*. Every theme contains its opposite, its musical inversion. Man, alienated from self and society, finds reconciliation in God; despair becomes the way to joy; time and history become ways leading out of time and beyond history.

To express such a context of opposition and contradiction, Eliot came, almost by necessity, to employing the form and method of music. For music has the striking ability to express *simultaneously* opposite states of feeling. In the opening fugue of the C# Minor Quartet, Beethoven states a theme which contains polar extremes of feeling. The first four notes [A] generate extreme tension; the *sforzando* on A is a cry of pain. The second half of the theme [B] is suave and conciliatory, offering resolution to the tension of the first four notes. These two motifs make up the basic material of the first movement:



A second theme, derived from motif B, introduces a mood of repose and quiet:



At bar 91 something extraordinary happens. The quiet second theme is played by the first violin, and imitated below at the sixth by the second violin. At the same time the viola enters with the four-note motto:



It is toward the expressiveness of the above passage—where the first motif, agonized and unresolved, is set against its own emotional opposite—that Eliot is striving. We know that poetry can never achieve such absolute expressiveness; the sounds of language can not combine in the way that musical tones unite or oppose. Yet we must remember that Eliot is searching for a poetic medium which transcends the limitations of language, and that the forms and structures of music can provide patterns to reach into the mystical silence where opposites are reconciled:

. . . words or music reach

The stillness, as a Chinese jar still

Moves perpetually in its stillness.

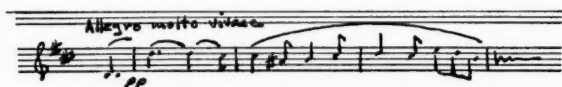
Not the stillness of the violin, while the note lasts,

Not that only, but the co-existence,

Or say that the end precedes the beginning,

And the end and the beginning were always there  
Before the beginning and after the end.<sup>18</sup>

The second movement of the C# Minor Quartet is an intermezzo, lyrical and urgent in mood. There is a sudden change in tonality, accomplished by simple and surprising means. At the end of the fugue, the texture thins out to a bare C# played by all four instruments; then the instruments quietly move up a semitone to D, establishing the tonality of D Major. The first violin swings into an iambic tune:



The instrumental color is more various than in the first movement; the melodies move in octaves and unisons. The movement hesitates; the tune hurries along, then slows down, then picks itself up again. The meaning seems full of human concern. We hear fevered haste and a sense of indirection. It is one of those incomplete moments in life when we temporarily lose our sense of purpose. It is also a moment of descent; from the lonely contemplation of the first movement, we return to middle earth—where we hear

. . . upon the sodden floor  
Below, the boarhound and the boar  
Pursue their pattern as before. . .<sup>19</sup>

The great center of the quartet is the fourth movement. This world is inhabited and populous. We find in the theme and its six variations a wealth of possibility and development:



<sup>18</sup> From *Burnt Norton*, loc. cit.

<sup>19</sup> From *Burnt Norton*, loc. cit.



The variations encompass a great variety of expression. We hear how certain less exalted but more comfortable emotions "go": pathos, regret, nostalgia, even sentimentality. Toward the end of the movement, the variations become freer; we sense impending dissolution and chaos. The theme returns, disappears, then returns again. It is finally repeated in a hesitant, almost timid statement:



We should note the long pauses between each phrase. Beethoven exploits the expressive possibilities of silence: where we expect another repetition of the phrase, we get a bar-long rest. The phrase echoes silently in our minds. Eliot, too, knows the place of silence in metrical schemes, and the expressive value of a significant pause:

The only wisdom we can hope to acquire  
Is the wisdom of humility: humility is endless.

The houses are all gone under the sea.

The dancers are all gone under the hill.<sup>20</sup>

What Eliot may have learned from Beethoven can only be conjectured, but it is undeniable that their use of silences is often strikingly similar.

The fifth movement is in mood and movement a scherzo, although it is written in double and quadruple time. We can hear

Earth feet, loam feet, lifted in country mirth  
Mirth of those long since under earth  
Nourishing the corn. Keeping time,  
Keeping the rhythm in their dancing  
As in their living in the living seasons<sup>21</sup>

We hear the joy of continuous movement in energetic dance. There are pauses to catch our breath (marked in the score

<sup>20</sup> From *East Coker*, *loc. cit.*

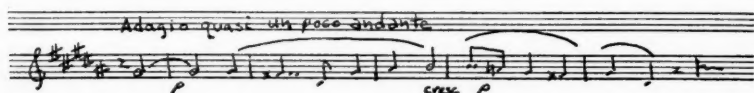
<sup>21</sup> From *East Coker*, *loc. cit.*

*molto poco adagio*); then the dance rushes on. A contrasting theme appears; it is marked in the score *piacevole*, agreeable:

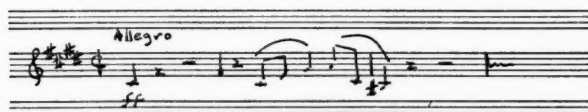


The entire movement is in good humor. After extensive repeats the fifth movement ends on three repeated E's.

Between the fifth movement and the finale is another intermezzo—improvisatory, brief, and pregnant with expectation. It consists of a single melody, played first by the viola, then an octave higher by the first violin. This melody is almost indescribably piercing in its melancholy. It recalls the loneliness and pain of the first movement; it looks forward to the inexorable march of the finale:



The finale opens with a powerful rhythmic motif which is an anagrammatic arrangement of the motto phrase: the G#, B#, C#, A of the first movement is now C#, G#, A, B#:



The first violin immediately plays a march rhythm which controls the whole last movement. Another theme appears, "pathetic" in quality and also based on the motto phrase:



This material is developed in sonata form. The tonality of D Major returns in the recapitulation like a threat. This remote key has the effect of not destroying, but of strengthening the C# tonality. It is affirmation by negation; it is reaching a desired conclusion by indirection, or by what might at first seem the wrong direction:

In order to arrive at what you are not

You must go through the way in which you are not.

And what you do not know is the only thing you know

And what you own is what you do not own

And where you are is where you are not.<sup>22</sup>

Beethoven leads us along harmonic paths which seem far from the main road. At first there seems no apparent connection between the intrusive sections in D Major and the final assertions of C# tonality. Historically this harmonic relationship, appearing usually as the Neapolitan Sixth, was a colorful and decisive type of cadence. It became a mannerism in the work of Alessandro Scarlatti and certain of his contemporaries. Beethoven enlarges what was actually a musical cliché into a pole or anti-pole. Thus the harmonic connection is made through contradiction, as love is sometimes reached through hate. When we examine the whole quartet, we understand that this D Major is an element of almost symbolic significance. We might call it the "destructive element" which carries the threat of chaos. The quartet struggles with and overcomes this threat; in the last bars we hear again the motto theme, a welcome call to order, and the work closes in major tonality.

Polarity and dramatic conflict are the essence of the Quartet in C# Minor; its meanings are completeness and unity. We understand completeness in the variety of its forms and the exploitation of every technical means. We understand its unity not only as a function of its related and contradictory themes and harmonies, but as the musical expression of a

<sup>22</sup> From *East Coker*, *loc. cit.*

world in which defiance and resignation, joy and pain, abstract existence and warm humanity, find their reconciliation.

## V

What I have heard in Beethoven is what I feel to be the significance of his music: "a knowledge of emotional and organic experience, of vital impulse, balance, conflict, the *ways* of living and dying and feeling." I have tried to suggest the relevance of Beethoven's music to *Four Quartets*. I also suggest that Beethoven's music "means" what Eliot's poetry means. Eliot starts with aspects of Beethoven's external form in the overall organization of his poems. More importantly, Eliot handles his syntax and prosody like musical sequences. Most importantly, Beethoven and Eliot work with a root experience: to see and understand an ordered universe as the inevitable expression of its conflicts and tensions, and to see disorder as the very patent of order.

# THE SEVEN DEADLY SINS: WRATH\*

## A Biologist's Viewpoint

*Hudson Hoagland*

### I. Introduction

THE SIN OF WRATH for Dante, as he discussed it with Virgil in Purgatory, was the anger and aggressive behavior of man toward his fellows, often displayed in the name of righteousness but carried out in a spirit of revenge for real or imagined injuries or as a result of his ambition for power. At the third cornice of the mountain of Purgatory, according to Dorothy Sayer's translation of *The Divine Comedy*, Virgil says to Dante:

That love of hurt means love of neighbours' hurt,

Some hope their neighbour's ruin may divert  
His glory to themselves, and this sole hope  
Prompts them to drag his greatness in the dirt;

Some in their fear to lose fame, favor, scope,  
And honor, should another rise to power  
Wishing the worst, sit glumly there and mope;

And some there are whose wrongs have turned them sour,  
So that they thirst for vengeance, and this passion  
Fits them to plot some mischief any hour.

The concept of sin is not one used by scientists. Sin is a theological term for an act that is an affront to the will of

\* This paper was one of a series of lectures on Dante's seven deadly sins in the light of modern scientific considerations and changes in concepts about these sins since the Renaissance, given by members of the medical and biological professions at the First Unitarian Church of Worcester, Massachusetts, during the winter.

God, and scientists, as scientists, have no operational procedures for dealing with divine sanctions or of knowing what they are. I shall accordingly consider evil rather than sin, and define evil as that which is harmful to human dignity in man's pursuit of the good life. I would like to consider the nature of anger and aggression from the point of view of its physiological mechanisms and evolutionary history, together with the control of aggressive behavior by other biological processes, which have had an equally long evolutionary development. Since man is undoubtedly his own worst enemy, the control of his aggressions and their channeling into fruitful fields of endeavor may well determine his very survival in our nuclear age.

## II. The Evolution and Physiology of Aggressive Behavior and its Control

According to the best evidence available, life in some form or other has probably existed upon the earth for about two billion years. During this time, profound changes in the land, the atmosphere, the oceans, and environment of competitive organisms have taken place to which living things had to become adapted or perish. We know that for each form of life here today thousands of forms have perished in the course of evolution. Evolution proceeds by a screening process of natural selection without design or purpose. The process of reproduction passes along from generation to generation by way of the germ plasm, a highly specific code of messages in the form of structured large molecules of deoxyribonucleic acids which constitute the genes. These are essentially blueprints of heredity and tell each cell of the developing embryo what to make and how to do it. As cells multiply to form the embryo, each receives a set of each of the parental genes. These chemically produce the hundreds of protein catalysts or enzymes in each cell that regulate the cell's chemical processes.

Little that happens in the environment of an organism can directly affect the genes of the germ plasm, but chemical changes in them do take place from time to time, and these changes are inherited. These changes may result from chance bombardment by radiant energy in the form of cosmic rays coming in from outer space, from beta and gamma rays from decomposing radioactive minerals in the earth, and from traces of radioactive isotopes such as carbon 14 and potassium 42 taken in with food and air. In addition, the larger molecules, which are the genes, are somewhat chemically unstable and are more so the higher the temperature. When they change in structure, the highly specific code in the germ cells that tells the next generation how to make a duplicate of its parent stock is correspondingly changed so that the offspring receives a modified blueprint of its chemical structuring compared with those that produced the parents. Such a change in the basic information passed on by a gene is called a mutation, and such mutations are ultimately inherited by the offspring.

Only those mutations which confer advantages on the offspring in the face of a given environment at a given time will, in the long run, have survival value over the generations. Geneticists now know that over 99 per cent of all mutations that occur in plants and animals are harmful and produce damage or death to the offspring or to its descendants in one or in subsequent generations. Less than one per cent of the mutations confer advantages and it is these mutations alone that contribute to evolutionary progress. This is as we would expect, since the detailed structure of the molecules which are the genes is the end result of hundreds of millions of years of repeated selection by evolutionary screening for fitness. Almost any random change in a gene would therefore be expected to mar these highly organized blueprints for heredity. In the process of evolution by natural selection, there is no evidence of purposive design; there is only chance



variation of the genes and elimination of forms least fitted to survive. The apparent design we see around us in nature in the form of beautifully adapted plants and animals is a result of natural selection preserving the few adaptable forms and eliminating the others.

During the course of the last half billion years, one mode of favorable natural selection in animals has been the development of elaborate nerve nets which connect sense organs responding to stimuli from the environment with some sort of central nerve structure. This central nervous organ or brain codifies information coming in from the sense organs and sends messages out over nerve fibres to muscles, in this way producing behavior appropriate to survival. Through such behavior, the animal survives and procreates, thus passing on its genes to succeeding generations. The evolution of the nervous system, which has developed in all animals above the level of sponges, and which reaches its apex in man, has produced greater and greater elaborations of behavior, depending on the number of nerve cells in the brain and their richness of inter-connections. All that we know about the world of events interacting with us—both the seen and the unseen—we know through the action of this remarkable complex of some nine billion inter-connected nerve cells that constitute the human brain. This is the case whether we are responding reflexly to the prick of a pin or are a Dante composing his *Divine Comedy*.

Evolution has been characterized by intense competition of animals with each other for food, for mates, and for territories of activity, and this has put a premium for survival upon those forms which chance to develop effective mechanisms of attack and defense against each other. Thus the aggressive predator has had a biological advantage over his weaker rivals; similarly, the ability to escape from predators has conferred marked survival advantage. The psychological concomitants of aggression and flight are anger and fear;

these are deeply imbedded processes in our organs and tissues as a result of natural selection over the last half billion years. While clams and oysters don't fight, aggressive fighting is a characteristic of virtually all motile animals beginning with such things as lobsters and insects, on up to and including man, whom Conrad Lorenz has characterized as an especially quarrelsome ape.

Reptiles, birds, and mammals have certain similarities in the organization of their nervous systems which are involved in aggressive behavior; during the last 40 years much information has accumulated about the mechanism of anger and its expression. Dr. Walter Cannon showed, for example, how certain glands of internal secretion pour out a hormone under emotional stress that facilitates an animal in its fighting or escaping from enemies. He showed that the hormone adrenalin is released from the medulla of the adrenal glands at the time of fight or flight and is carried by the blood to the tissue of the body, where it functions to facilitate or boost the activity of a branch of the vegetative nervous system called the sympathetic nervous system, which regulates internal processes and is not under voluntary control by the brain. The action of adrenalin and the sympathetic nerve fibres produces erection of the hairs, making the animal look larger and more formidable. It dilates the pupil of the eye permitting more light to enter; it hastens the clotting of blood so that, should the animal be wounded, there is better protection from blood loss; it inhibits blood flow to the digestive tract where it is not needed in combat and shunts the blood through the vessels supplying the great muscles of the limbs, where it facilitates their action by supplying more oxygen and speeding up removal of waste products. The same process discharges sugar as metabolic fuel from its storehouse in the liver. It increases the heart rate, elevates the blood pressure, and so forces more blood to muscles and brain. It relaxes the bronchioles in the lungs so that breath-

ing becomes easier, thus making more oxygen available for laboring muscles and hastening removal of carbon dioxide. If we remove the sympathetic nerve chain from an animal such as a cat and, by so doing, cut the nerve fibers to the adrenal medulla, and if we then expose the cat to a barking dog, the cat is now unable to make use of these mechanisms to meet the stress of combat or flight. It will, however, endeavor to escape or fight, although if it runs for a distance, it is likely to become exhausted quickly and fails to be very effective in fight or flight, since its emergency mechanisms have been destroyed by the operation. These, then, are some of the motor concomitants of rage and fear, but the actual psychological experiences of the emotions are determined by processes within the brain itself.

Philip Bard, one of Cannon's students, beginning some 30 years ago, together with many others since, has studied the dependence of emotion upon brain structure and function. One technique has been the use of brain surgery by which certain parts of the brain are removed under anesthesia; at the same time, the animal is able to survive afterwards for long periods in the laboratory. Much of the information so accumulated has been of great value to neurologists in the treatment of patients, and some of the findings with animals have been confirmed by studies of patients suffering from brain lesions brought about by head injuries or by tumors. It is possible to remove the outside portion of the brain, the cerebral cortex, and most of the midbrain from a cat, leaving only the very deep brain structures. When recovered from the operation, such a cat, though unable to coordinate effectively, displays violent and undirected rage responses when touched lightly, or picked up, or in any way stimulated. These rage responses occur only if the hypothalamus, a small part of the deep brain structure, is left intact. The removal of this area of the brain, which is the controlling center for much of the emotional behavior discussed above, leaves the cat in a

torpor, still able to swallow food put in its mouth but unable to regulate many internal body processes. If vigorously stimulated, the cat can show some emotional response; it shows very little, however, compared to the violent reactions produced by an animal with intact hypothalamus.

The higher brain centers thus are seen to act as a continuously inhibiting factor in controlling emotional expression of the hypothalamus; this is especially true for what we call the neocortex—that part of the brain most highly developed in man and the higher apes, and which has emerged most recently through evolution, only during the last few million years. Experiments have been carried out on animals in which other portions of the cortex have been selectively removed. Destroying surgically the subcortical amygdaloid nucleus on both sides has transformed friendly cats into hostile, angry ones. These animals may show few behavior abnormalities other than their change to an evil disposition. Thus there is evidence that in a normal animal there is a balance between regions which excite anger and those which repress it. By means of a brain operation on monkeys involving removal of limited regions of the temporal lobe (in the hippocampus and amygdalla), it has been possible to convert wild, untamable, savage beasts into tame, gentle, and friendly ones. Like the cats, these monkeys show no gross abnormalities of behavior other than a change toward sweetness and light in their attitude toward other monkeys and man. Such operations have not as yet been carried out successfully on man, although marked changes in personality and relief from intense anxiety have been brought about in some patients by the surgery known as lobotomy or psychosurgery applied to severely disturbed psychotic patients. This operation severs the fibers that run from the thalamus in the midbrain to the frontal lobes of the neocortex.

Physiologists have implanted small wires, insulated except

at the tips, deep in selected regions of brains of anesthetized animals. Following the surgery, such animals may go about without discomfort with the wires in place. Weak electrical stimuli sent over these wires can produce normal sleep on the one hand, and intense emotional excitement on the other, by stimulating specific regions of the hypothalamus and reticular formation of the brain stem in regions quite close to each other. Even changes in the intensity and frequency of stimulation of the same region may produce shifts in mood and emotion of the animal. Somewhat comparable studies have been made in connection with diagnosis and therapy on certain mental and neurological patients with results similar to those obtained on animals. Thus we are coming to know something about the actual control of emotion and aggression from the point of view of brain mechanisms, but very much more is still to be learned.

The recent development of the so-called tranquilizer and energizer drugs now widely used in psychiatry has done much to cut down aggressive behavior of mental patients in hospitals, and also to relieve tensions and anxieties in non-hospitalized subjects who take these drugs. At the same time, social consequences of the general use of such substances on a large scale raise many questions. Aggressiveness may thus be manipulated, especially as biochemists learn more about the action of drugs on the brain. It is probable that within a few years drugs may be available which will markedly change the personality of an individual in quite specific ways. While it may seem fantastic, it is alarming to think of how such drugs and advances in psychosurgery might be misused by an unscrupulous dictator, avid for power and indifferent to concern for the dignity of the individual. After all, in the past our ancestors used alcohol to demoralize the Indians in some areas, and the distribution of opium by conquerors in the Orient has been an ancient and often-used practice to subdue populations.

Students of animal behavior have made a number of interesting observations about aggression. Most species of birds and also of mammals, together with many insects such as ants and bees, are highly social organisms, and the societies they form may be quite complex. This is especially true of ant, termite, and bee colonies; in these, as in some of our contemporary communistic states, the individual worker counts for little but the society is all-important. In ant, bee, and termite colonies, the queen—the one individual capable of reproducing more ants, bees, or termites—is fed and her offspring served by hundreds or even thousands of sexless workers. Among some species of ants, intercolonial warfare is not uncommon and slaves may be captured and brought back and forced to serve the conquering colony.

Among social groups of birds and mammals, social organization is relatively loose compared to that of ants and bees, but in each social group there tends to be a remarkable relationship between individual members in which one animal dominates another, which in turn dominates a third, which then dominates a fourth member, in such a way as to determine the true hierarchy of dominance within the herd, or pack, or flock; most birds are social and form flocks. Thirty years ago Shelderup-Ebbe described the behavior of barnyard hens. In such a flock, the hierarchy has been called the pecking order—Hen A may peck Hen B, B can peck C, C can peck D, D can peck E, and this order, once established, is not changed. It is originally established by fights and, once the relationship is set up, it makes for a stable flock where each bird knows its place. Similar relationships have been observed both in the laboratory and in the field in herds of yak, seals, monkeys, baboons, packs of dogs, cages of rats and mice, prides of lions, and a host of other animal forms. At the root of these established orders of dominance is fighting ability which decides the particular niche for each individual in the organization. In laboratory colonies of rats, mice, and mon-

keys, the dominance order has been changed experimentally by the use of drugs or by psychosurgery. The Army Chemical Center has recently reported on a gas that, when breathed, makes cats, for a period of an hour or two, afraid of mice. This has interesting implications for use against an enemy in future wars.

A discussion of the biological survival value of this hierarchical arrangement in societies would take us too far afield. What I wish to emphasize is the nature of the basic pattern of aggressive behavior characteristic of social animals built into us over millions of years of competition for survival. It needs no belaboring to point out that man is an animal inheriting the same basic structural and functional organizations in his nervous systems as other mammals of which this behavior is a deep-rooted manifestation.

### III. The Survival Value of Cooperation

While aggressive behavior has had biological survival value, there is another form of behavior, namely cooperation, which has contributed effectively to preserve the species and the individual and this, too, is deeply innate. Even animals show what we would call altruistic behavior. The sacrifice of life of mother animals in protecting their young, the protection of members of the herd as seen in yaks by organized defensive tactics even at the cost of individual lives, are forms of conduct which in us would be called ethical. Such behavior has great survival value, preserving the group and the species in a hostile world. Symbiosis among plants and animals is of prime significance in survival and advancement, both of the individual and of the species. The hundreds of remarkable aids afforded by plants and animals to each other, even between widely different species, can teach us much about the essential value of mutual cooperation in human societies. The biological equivalent of the golden rule is highly significant. All animals are ultimately dependent for their existence upon the plant world.



The atmospheric oxygen we breathe is produced by plant photosynthesis. Plants utilize sunlight to form foodstuffs such as carbohydrates, upon which both they and animals depend. Evolutionary progress may, in a sense, be measured by the development of complex, multicellular plants and animals from primitive single cell forms in which specialized cells cooperate to maintain the whole organism. The service of individual cells in special organs and tissues to the functioning of the total organism characterizes the metazoan of which we are examples, and emphasizes the dependence of each cell upon the activities of the others.

#### IV. Nervous Systems, Revelations, and Ethics for Survival

Different types of nervous systems, ranging from those of jellyfish to man, have evolved by natural selection, and the more elaborate nervous systems have conferred special advantages on organisms possessing them. The ability to remember—that is, to bind time—so that past experience can guide present behavior and project conduct in terms of future contingencies, is a function of nerve net elaboration. Man's highly organized brain makes possible his rich imagination. His ability to use language as symbols is far more advanced than that of other animals and makes possible continuity of ideas from generation to generation. The information accumulated through the spoken and written language makes possible the development of cultures and civilizations. This transference is especially accentuated by the fact that of all animals man has the most delayed period of infancy and dependence upon parental care, thus making possible a level of indoctrination by ideas and concepts biologically quite unique. The result is that we have things to fight about in addition to claims for territory, mates, and food that concern other animals. Prestige and power in the human dominance hierarchy can be established through the promotion of ideologies and group concepts of a symbolic nature. Thus more

human blood has probably been spilled in religious wars over the centuries than by any other causes of conflict. One is reminded of the Crusades and of the Catholic and Protestant conflicts of the 16th and 17th centuries, the human sacrifices of primitive religions, witchcraft, the Inquisition. In recent times the great conflicts and hate have been over concepts of national sovereignty and between ideologies such as fascism, communism, and the free enterprise system of the West.

Our intense adherence to broad, encompassing concepts of philosophy, theology, and politics is inherent, it seems to me, in a basic property of our nervous systems. This property has resulted from the survival value in the course of evolution of nervous systems capable of bringing together very diverse aspects of the environment into meaningful patterns and configurations. In recent years psychologists of the gestalt school have helped to illuminate this integrating property of the brains of animals and of men. Studies of learning have been useful here, particularly in relation to the phenomenon of insight, in which puzzling situations, at first devoid of meaning, suddenly come together to make sense. In the vernacular, this sudden precipitation of significance out of a puzzle has been called the "a-ha phenomenon"; the experiencing of "a-ha, that's it" associated with the clothing of a situation with meaning is emotionally very satisfying, and is the major charm of scientific research and of artistic creation. This ability to perceive meaningful configurations has been of great survival value in the course of evolution, both for the individual and for the species.

Curiosity and the drive to explore is characteristic of all birds and mammals. The "a-ha phenomenon," with its emotional charge, can be thought of as a kind of revelation, although not necessarily one corresponding to objective truth. It seems to me to be of the essence of what William James and others have called the religious experience. The basic

phenomenon of revelation can also be demonstrated in animals. It is not at all exclusive to the prophets, or to a Shakespeare, or to an Einstein. Let me give examples. The psychologist, Kohler, put a very hungry chimpanzee in a cage with a banana out of reach behind the bars. A stick was also put in the cage. After various attempts to reach the banana by hand or to break out of the cage, the chimpanzee suddenly grasped the situation, picked up the stick, and fished the banana within reach of his hand. It happened all at once—the problem solved by the flash of insight, by the closure of a meaningful configuration—the relation of the stick to the banana was perceived. A chimpanzee could do this also if two sticks were put in the cage, neither one of which alone would reach the banana. But if the sticks could be put together, joined fishpole fashion, to make one long one, this would be done suddenly and effectively by the brighter apes, and the banana retrieved. Again, Kohler hung a banana from the ceiling of a room, out of reach of the chimp. Several boxes were distributed around the room and, after a time, the ape suddenly solved the problem by piling one box on another, climbing swiftly up before his architectural achievement could collapse, and so grabbed the banana. This sort of problem is approximately the level of difficulty that can be solved by a normal three- or four-year-old child.

The ability to form meaningful patterns of the universe we live in is, in my opinion, the basis for man's interest in science, art, philosophy, and religion. The drive to make sense of the world is a profoundly deep one inherited from our subhuman ancestors and necessary for our survival as a species. The more general and all-compassing one's view of the universe that is compatible with one's background of information, the more satisfying it is. Perhaps this is why monistic concepts in philosophy and monotheistic concepts in theology are so appealing. Because of man's long memory span and because of his intelligence and ability to communi-

cate and to criticize his own intellectual constructs, something new has been added to resolve senseless fights over the rightness of one's particular solutions of political and theological problems. Science is unique among the organized activities of men in having a built-in technique, through experiment and sharable observations, for testing its conclusions and obtaining consensus and so resolving controversies. An extension of this attitude of scientists toward the nature of truth applied to political and religious dogma is highly desirable. If the professional ethics of science could be generalized into a world ethic, it could, I believe, do much to save civilization from tearing itself apart by nuclear war.

### V. Conclusions

I would like, in summary, to point out that conflicts arise in men and between groups of men because of deeply established biological patterns of behavior concerned with fighting and aggression on the one hand, and with the tendency to develop proprietary rights to things and to ideologies on the other. Running through this is man's drive to dominate his fellows—a drive which he knows has to be moderated by agreement, law, and custom if society is to survive. He must repress his aggressions and in so doing, if he is wise, may channel them into fruitful activities that are truly constructive. For altruistic, cooperative behavior has great biological survival value as well, as we have seen. The control of aggression by intelligence seems to me the only hope for our survival in a nuclear age. We now possess weapons which can quite literally destroy in an hour a large segment of the population of a given part of the world, and can, at the same time, produce enough radioactive fall-out to damage permanently the genes of the oncoming generations, so that in time there may be no survivors. This stark reality faces us, and history, if there were to be any history after a major nuclear war, may well record that man's great cerebral cortex, making possible

his use of language and other tools to develop ideologies and atomic bombs, turned out to be a phylogenetic cancer leading to his extinction, just as other maladaptations have caused so many forms of plants and animals to fail and perish. Man's cerebral cortex has given him nuclear weapons. Is it capable of controlling his hypothalamus and other primitive brain structures in such a way as to abolish war and let him survive?

## SCIENCE AND GNOSIS IN JUNG'S PSYCHOLOGY

*Thomas J. J. Altizer*

### I

ALTHOUGH MANY REGARD him as our most distinguished contemporary psychologist, Carl Gustav Jung is unquestionably one of the most controversial figures of our day. It is true that he has been generally ignored or attacked by the academic psychologist, but he has attracted a significant following—and in many respects even a cult—among a large number of disenchanted intellectuals. The modern rebellion against science, against reason, and against the “objectification” and secularization of the modern world and experience has found a champion in Jung. Few major writers of our time have conducted a more radical attack upon the scientific and rational consciousness than has Jung. Yet he has done it in the name of a “scientific” psychology. The paradox of Jung’s thought is that his very categories invert the most basic canons of scientific analysis; and, yet, he insists that his categories are “scientific.” Despite his frequently repeated—and even compulsive—scientific claims, Jung has found his spiritual home in what he himself identifies as the Gnostic tradition. Gnosticism almost defies definition—but it might be defined as a violent reaction against the world of self-conscious and rational thinking evolved by Greek culture and an ecstatic return to the mythical world of the Oriental religious sensibility. To borrow Nietzsche’s categories, it is a victory of the Dionysian over the Apollonian consciousness. Ancient Gnosticism rebelled not simply against the world—but against the whole Greek way of understanding and celebrating the

world. And it did so in the name of a deeper and more intuitive understanding than that which could be supplied by *Nous*. Its *Gnosis* was a mystical mode of knowledge which could realize itself only by means of a process of dissolving all awareness of the world. Jung has frequently called himself a Gnostic. For he regards himself as a product of that subterranean tradition of Western thought which has produced alchemy and astrology (Jung identifies these systems as naive psychologies of the unconscious). But it is the German Romantics who are his true fathers.

The German Romantics seized upon the Unconscious as that interior-imaginative region wherein man can encounter the ideas and images which had been obliterated from consciousness in man's fall from the primal unity. The real burden of the Romantics' attack upon the rationalism of the Enlightenment rested upon their discovery of the life-giving power of interior contemplation and unconscious intuition. Ricarda Huch asserts that the essential characteristic of early German Romanticism was the urgent desire not to destroy by sheer ratiocination the subconscious in man.<sup>1</sup> The result of this defensive reaction was an impulsive flight to irrationalism and the occult world of the dream. Thus, Novalis can speak for the whole left-wing movement of German Romanticism with his words: "Die Welt wird Traum, der Traum wird Welt." The night—as well as the sea—was commonly taken by the romantics as a symbol of the unconscious, and as the realm opposite to that of reason. As such, it became the repository of the images and symbols pointing to the spiritual sources and destiny of the human soul, which only through a process of separation and alienation had been forced into the fallen world of self-consciousness and reason. The dream, myth, number, magic, the stars, the night, the sea, etc.—all became symbols and instruments of the spiritual redemptive

<sup>1</sup> Ricarda Huch, *Blutezeit der Romantik* (Leipzig, 1901), p. 127. Cf. Victor White, *God and the Unconscious* (Chicago: Henry Regnery Co., 1953), pp. 23-39.



process which is thus seen to take place in the unconscious depths of the soul.

Carl Gustav Carus is the romantic philosopher who most fully anticipated the thought of Carl Gustav Jung. It is noteworthy that Albert Beguin—in his magisterial study of German Romanticism—had entitled his chapter on Carus, "The Myth of the Unconscious." Carus' distinction between the relative unconscious and the absolute unconscious clearly parallels Jung's distinction between the personal unconscious and the collective unconscious. In his *Letters on Landscape Painting*, Carus gives expression to the myth of cosmic unity which was one of the central motifs of his thought:

Man, in contemplating the magnificent unity of the scenery of nature, takes cognizance of his own smallness; and, sensing that everything is in God, he becomes lost in this infinity, renouncing every sort of individual existence . . . Thus abased, this is not a loss but a gain: here everything which can ordinarily be seen by the spirit becomes accessible, almost, to the physical eye: he becomes convinced by the unity of the infinite Universe.<sup>2</sup>

For Carus, both the conscious psyche and the unconscious are emanations of this supreme unity. Adopting the pantheistic concept of the cosmic organism, Carus looks upon the dream world as that area of psychic activity wherein the conscious psyche is returned to its unconscious roots in the primordial unity. For the dream is that prophetic activity wherein are enacted the "universal feelings" of all peoples. As Beguin has said, all the analyses of Jung on the analogies of dream and myth are prolongations of the intuitions of the romantic philosophers.<sup>3</sup>

Jung has nowhere related his work to his romantic predecessors (for while cultivating various esoteric ways, Jung has largely ignored the Western philosophical and literary tradi-

<sup>2</sup> Quoted by Albert Beguin, *L'Ame Romantique et le Reve* (Paris, 1946), p. 127.

<sup>3</sup> *Ibid.*, p. 141.

tion). Indeed, in abandoning (for "scientific" purposes) the metaphysical foundations of the romantic thinkers, Jung has left unstated the one principle which could give unity to his psychology—aside from the fact that the statement of this principle would transform his psychology into a metaphysical system. Jung follows the romantics in believing that in dreams we enter the deeper and more universal, truer and more eternal man.

The dream is the small hidden door in the deepest and most intimate sanction of the soul, which opens into that primeval cosmic night that was soul long before there was a conscious ego and will be soul far beyond what a conscious ego could ever reach. For all ego-consciousness is individualized and recognizes the single unit in that it separates and distinguishes, and only that which can be related to the ego is seen. This ego-consciousness consists purely of restrictions, even when it stretches to the most distant stars. All consciousness divides; but in dreams we pass into that deeper and more universal, truer and more eternal man who still stands in the dusk of original night, in which he himself was still the whole and the whole was in him, in blind, undifferentiated, pure nature, free from the shackles of the ego. From these all-uniting depths rises the dream, however childish, grotesque, or immoral.<sup>4</sup>

Dreams are impartial, spontaneous products of the unconscious psyche, and, therefore, they are not distorted essentially by the subjective individuality of the conscious mind. They are "pure nature," and thus more apt than anything else to bring us back to the primary essence of humanity. For the dream "speaks in images, and gives expression to instincts, that are derived from the most primitive levels of nature."<sup>5</sup>

The theory of individuation—which is the foundation of Jungian psychotherapy—is the Jungian equivalent to the

<sup>4</sup> C. G. Jung, *Wirklichkeit der Seele* (Zurich, 1934), p. 49. The translation is taken from Jolande Jacobi, *Psychological Reflections: An Anthology from romantic quest for redemption through union with the un-*  
*the Writings of C. G. Jung* (New York: Pantheon Books, 1953), p. 46.

<sup>5</sup> C. G. Jung, *Modern Man in Search of a Soul* (New York, 1933), p. 30.

conscious psyche. Jung stated his theory of individuation in a series of lectures given at the Eranos Congresses between 1932 and 1939. These lectures were collected and published in an English translation in 1940.<sup>6</sup> Two of the lectures ("Traumsymbole des Individuationsprozesses" and "Die Erloesungsvorstellungen in der Alchemie") were later considerably expanded and published with an introduction in the volume entitled *Psychology and Alchemy* (1944). This work is comparable in importance with *The Psychology of the Unconscious* (1912) and *Psychological Types* (1920). In fact, the editors of Jung's collected works have asserted that the major portion of his later work revolves around the material contained in *Psychology and Alchemy*. It is significant that in the last thirty years most of Jung's work has been devoted to what might be called the psychology of religion. Accordingly, most of the theoretical structure of this work is contained in the material just mentioned.

Jung defines the term "individuation" as meaning "the psychological process that makes of a human being an 'individual'—a unique, indivisible unit or 'whole man'."<sup>7</sup> It takes place primarily in the realm of the unconscious. For the unconscious is prior to the conscious mind, and is autonomous; it is a law unto itself. Moreover, "the conscious mind is based upon, and results from, an unconscious psyche which is prior to consciousness and continues to function with, or despite, consciousness."<sup>8</sup> The goal of the individuation process is to join together in a living relation the conscious and the unconscious poles of the human psyche. Wholeness of the personality is attained when all the pairs of opposites within the psyche are differentiated and related in an organic and healthy manner. The "way of individuation" is actually the moral process of becoming one's Self. Thus, it is identical with the "way of religion," regardless of the diverse expres-

<sup>6</sup> C. G. Jung, *The Integration of the Personality* (London, 1940).

<sup>7</sup> *Ibid.*, p. 3.

<sup>8</sup> *Ibid.*, p. 13.

sions which this "way" may take in the history of religions. Self-searching and self-realization are indispensable conditions for the individuation process; for individuation means "becoming an individual being, and, insofar as we understand by individuality our innermost, final, incomparable uniqueness, becoming one's own Self."<sup>9</sup> This is the goal of Jungian psychotherapy, which Jung believes to be the modern Western scientific equivalent of ancient religious disciplines.

## II

Jung has stood apart from the dominant religious tradition of the West and has sought guidance in various forms of Gnosticism and Oriental religion: "It is the East that has taught us another, wider, more profound, and higher understanding, that is, understanding through life."<sup>10</sup> Although Jung's own religious inclinations are largely theosophical in character, he has repudiated all Western imitation of the East and insisted that:

The wisdom and mysticism of the East have indeed very much to give us even though they speak their own language which is impossible to imitate. They should remind us of that which is similar in our own culture and which we have already forgotten, and should direct our attention to that which we have pushed aside as insignificant, namely, the fate of our own inner man.<sup>11</sup>

Finally, the unconscious foundations of Western and Eastern wisdom are identical, and Jung demands that we stand firmly on our own feet if we are to assimilate the spirit of the East. Thus, it was through alchemy that Jung chose to reach the religious way of the Oriental mind.

<sup>9</sup> C. G. Jung, *Two Essays on Analytical Psychology* (New York: Meridian, 1953), p. 183.

<sup>10</sup> C. G. Jung and Richard Wilhelm, *Secret of the Golden Flower* (New York, 1931), p. 78.

<sup>11</sup> Forward to Heinrich Zimmer, *Der Weg zum Selbst*, ed., C. G. Jung (Zurich, 1944), p. 23.

The most effective way of discovering the contents of the unconscious is via the dream. The elements of the dream are derived from both conscious and unconscious sources, and their arrangement in the dream may not be understood through the usual laws of causality. The categories of space and time are transcended in the dream. Furthermore, dream language is archaic, symbolic, prelogical—a picture language requiring special methods of interpretation. The dream is purely a manifestation of the unconscious (both personal and collective) whose function is primarily a compensatory one designed to balance and complete the one-sided development of the conscious psyche. But it is in the symbolic world of the dream that unconscious processes are made most clearly visible to conscious analysis. Genuine dream symbols are products of the deeper layers of the unconscious which can never be fully expressed rationally, inasmuch as “symbols are never thought out consciously; they are always produced from the unconscious in the way of so-called revelation or intuition.”<sup>12</sup> Thus, a true symbol can never be explained. We can make its rational component comprehensible to consciousness; but its irrational component may only be grasped by feeling.

Jung's published studies of the individuation process have always revolved about the detailed analyses of a series of unconscious symbols, either as revealed by dreams or by his patients' spontaneous drawings of the figures of their dreams and imagination. In *Psychology and Alchemy*, additional material is supplied by two hundred and seventy illustrations largely drawn from old alchemical tracts which are gathered together as exemplifications of the alchemists' realization of the unconscious meaning of the individuation process. However, the primary material of this work consists of some four hundred dreams of a patient of Jung's which were objectively recorded in the series in which they occurred. In Jung's analysis, these dreams are seen to be manifestations of the

<sup>12</sup> C. G. Jung, *Contributions to Analytical Psychology* (London, 1928), p. 54.

process of individuation which is taking place in the psyche of the dreamer. Likewise, the images and symbols of these dreams are discovered to be recapitulations of ancient alchemical symbols which could not have been known to the dreamer. These images are frequently identical with alchemical ones, and Jung marshals enough evidence to convince the sympathetic reader that the parallel nature of these symbols cannot be due to mere coincidence. As Jung says, "the symbols of the process of individuation that appear in dreams are images of an archetypal nature which depict the centralizing process or the production of a new center of personality."<sup>13</sup>

The symbols here discussed are not concerned with the manifold stages and transformations of the individuation process, but with the images that refer directly and exclusively to the new center as it comes into consciousness. These images belong to a category which Jung calls the mandala symbolism. The term "mandala" denotes the ritual or magic circle used in Shingon Buddhism, Lamaism, and also in Indian Tantric yoga as a *yantra* or aid to contemplation. The Eastern mandalas are figures fixed by tradition which are drawn or painted, or sometimes even represented plastically, in ritual ceremonies. Jung insists that these Eastern symbols originated in dreams or visions, and are among the oldest symbols of humanity. The alchemists made use of similar symbolic designs and pictures which until recently had been taken as meaningless hieroglyphs, but which Jung has found to have a curious resemblance to pictures and phantasies produced by his patients. He believes that all these designs are symbolic representations of that *telos* toward which all inner growth and individuation tends, and which he gives the name of the "Self." For Jung, "the true mandala is always an inner image, which is gradually built up through active imagination, at such times when psychic equilibrium is distributed

<sup>13</sup> C. G. Jung, *Psychology and Alchemy* (New York: Pantheon Books, 1952), p. 41.

or when a thought cannot be found and must be sought for, because not contained in holy doctrine."<sup>14</sup>

In the historical models of the mandala, the god is symbolized by a series of circles, and the goddess by a square or series of squares. But Jung believes that the symbols which occupy the center of his patients' visions of mandalas have no reference to a deity. It may be a star, a sun, a flower, a serpent, or a human being, but never a god.

A modern mandala is an involuntary confession of a peculiar mental condition. There is no deity in the mandala, and there is also no submission or reconciliation to a deity. The place of the deity seems to be taken by the wholeness of man.<sup>15</sup>

But the "wholeness" of man is not the individual-subjective ego personality but instead the indefinable whole of him, an ineffable totality, which can only be formulated symbolically. Jung has chosen the term "Self" to designate the totality of man, the sum total of conscious and unconscious existence. It is a totality which includes all the components of the psyche as symbolized in the quaternity or mandala symbolism. However, the Self as representative of the wholeness and totality of man defies conceptualization and must stand forth as an irrational symbol which is a product of the deepest reaches of the collective and universal psyche. The Self as a psychic symbol lies deeper than the God-symbol. It is the final symbolic consummation of the individuation process, and thus is the deepest and highest image of man and the universe. For the Self is a symbol reflecting the essential identity of macrocosm and microcosm in the final and ultimate reality of the *Anima Mundi*—the World Soul. Christianity with its doctrine of the God-Man prepared the way for this Gnostic vision of the Man-God who is the soul of the universe. It is not Faust but Zarathustra who has triumphed in Jung.

The individual realization of the Self can take place only

<sup>14</sup> *Ibid.*, p. 92.

<sup>15</sup> C. G. Jung, *Psychology and Religion* (New Haven, 1938), p. 99.



by the vanquishment of that which in Western thought has been known as the personal. Eastern trans-personalism shines forth in Jung's vision of the "whole" man. "The more one becomes conscious of oneself through self-knowledge and corresponding action, the more that layer of the personal overlying the collective unconscious vanishes."<sup>16</sup> Jung confesses that he has chosen the term "Self" in accordance with Eastern philosophy which in Indian thought at least has never admitted the reality of self-consciousness in the Western sense.<sup>17</sup> He adheres to individuation in the left-wing romantic sense, which posits the dissolution of personal-subjective consciousness as the goal of human striving. It is true that he does not carry out his principles to their logical conclusion, but there can be no doubt of his sympathy with such Indian systems as the Vedanta. The Self is a magnitude superordinate to the conscious ego: "It includes not only the conscious but also the unconscious portion of the psyche and is therefore a personality, so to speak, which we too are."<sup>18</sup> Jung's real concept of personality is a hybrid version of Eastern and Western thought, for he wishes to retain the Western psychological conception but in the framework of an Eastern vision of the World Soul. Real personality is the personality of the total psyche—and this means that it is primarily an expression of the collective unconscious.

Jung has spoken of the ego as the opposite of the Self while insisting that the ego needs the Self, and vice versa.<sup>19</sup> Yet he has also said that the ego is a content of the Self, and the only content that we can know. "The individuated ego feels itself as object of an unknown and superordinated subject."<sup>20</sup> It is typical of Jung that he expresses such an observation in a psychological form, thus evading the question as to whether the

<sup>16</sup> C. G. Jung, *Two Essays on Analytical Psychology*, p. 189.

<sup>17</sup> C. G. Jung, *Psychology and Religion*, p. 100.

<sup>18</sup> C. G. Jung, *Integration of the Personality*, p. 154.

<sup>19</sup> Forward to Heinrich Zimmer, *Der Weg zum Selbst*, p. 21.

<sup>20</sup> C. G. Jung, *Two Essays on Analytical Psychology*, p. 269.

ego actually is a reality in any final sense. Nevertheless, it is difficult to avoid the impression that his psychological principles are grounded in a trans-personalism of an Eastern-Gnostic type. The Self as the ultimate expression and reality of the total psyche must be the all-consuming Subject which objectifies and thus destroys the individual ego. Jung will not face this conclusion in any systematic sense for he wishes to remain within the bounds of Western psychological and empirical thought. But it is this tension between Eastern philosophical principles and Western scientific methodology which provides the fundamental source of ambiguity and contradiction in Jung's work.

### III

Despite the fact that Jung's most basic principles and data are trans-rational, he has always avowed a concern with the preservation of the scientific method in the psychology of the unconscious. Already in the *Psychology of the Unconscious* (1912), he had evolved a mode of analysis which repudiated in principle the dominant canons of Western science. However, Jung's other great early work—*Psychological Types* (1920)—brought together the Gnostic-like analysis of the *Psychology of the Unconscious* with a Western and analytical mode of thought. And Jung has throughout his career announced his scientific purpose, and has generally provided a facade of "scientific" terminology and demonstration about his arguments. His tragic dilemma is that his deepest, most profound, and most moving portraits of the deeper regions of the unconscious proceed out of a Gnostic mode of thought. It is his effort to relate this deeper vision to the perspective of the scientific Weltanschauung which has been the chief source of the confusion which pervades the great bulk of his writings. The seeds of this conflict are already contained in the *Psychology of the Unconscious*. Here, the transition from a Freudian conception of the repression of libido to one of its

transformation and evolution is effected primarily by means of a teleological causality. Freud was being true to his scientific roots in insisting that psychoanalytic conceptions of causality must revolve about a mechanistic analysis. The real reason for Jung's ultimate abandonment of the scientific method was that he found through bitter experience that it was incapable of grasping the inner depth and vitality of the life of the unconscious psyche. In this respect his work was parallel to that of Bergson and the vitalists. However, Jung went further by following the roots of his romantic heritage to their inevitable conclusion.

If the reason of the analytic mind and the canons of the scientific method are inevitably incapable of apprehending the deeper layers of the psyche, then they must be discarded for categories which are so capable. For the unconscious is the true psychic reality and all else must be subordinated to its apprehension. If the categories of the conscious mind prove to be irreconcilable with the categories of the unconscious, then they must finally be discarded as organs of a lower and less real mode of apprehension. Jung's psychology must finally issue in the complete inversion of the Western scientific tradition. For the goal of his psychology is the understanding and psychical realization of the inner, spiritual world of interior and subjective contemplation. Nature becomes real in this process only insofar as it is embodied in the collective unconscious, and the conscious mind must be content to play the subordinate and temporary role assigned it by the deeper and "realer" reality of the unconscious psyche.

Jung would disavow the above conclusions if only because he insists upon wearing the mask of the empiricist (Jung calls himself a phenomenologist, by which he merely means that he refuses in principle to raise metaphysical questions). Yet, Jung the psychologist may be granted the virtue of facing the necessary consequences of the adoption of a method employing the imaginative observation of inner and spiritual proc-

esses. Furthermore, he has succeeded in producing some convincing evidence for the authenticity of these processes. The fact that his results in their own way parallel hundreds of systems of mystical and romantic philosophy is perhaps indicative as he claims of a natural activity and structure of the human psyche. Yet what might be termed the left-wing tendencies of his psychology follow the tradition of ascribing a higher reality to the inner world than to that of the external world. The collective or universal unconscious is but another form of the ancient *Anima Mundi* which is presumed to be the source and goal of all real existence. Jung has said that the psyche is existence itself and this can only mean that reality is only meaningful in terms of psychic activity. The unconscious replaces the world as the source of knowledge and experience. For consciousness is merely a product (and probably a transitory one) of the development and evolution of the unconscious.

The dominant tradition of Western thought has identified truth with the correlation of conscious ideas and external reality. The common protest against mystical and romantic philosophies has been that they are meaningless, for in their own postulates they present no criteria for the validation of the truthfulness of their ideas and principles. Here, the traditional conception of truth is simply taken for granted. But Jung has taken the romantic reaction to rationalism one step further by insisting that the conscious mind is psychologically subordinate to the unconscious psyche and therefore cannot be adopted as the ultimate criterion in the validation of unconscious processes. Freud, too, has asserted that the conscious mind is merely an expression of the unconscious. If consciousness has no direct and independent relation with the external world (by means of reason and sensory perception) but is related to it or to "reality" only in and through its relation to the unconscious, then the establishment of truth cannot be simply equated with the correlation of consciousness

and reality. Consciousness, in being identified as a function of the unconscious psyche, can at best produce a pragmatic or "reflected" body of truth. For the psychologist of the unconscious, real truth can only be a product of an encounter with the deeper layers and activities of the unconscious psyche. And for the Jungian, contemplation and symbolic interpretation (which are the basis of all *gnosis* systems) become the real paths to knowledge. Here, truth is archetypal (for Jung is an inverted Platonist who has replaced the realm of the ideas with what he postulates as the archetypes of the collective unconscious). Reason in the traditional Western sense of conscious understanding becomes transcended, inverted, and then destroyed by a way of thought which inevitably results in the annihilation of consciousness, history, and nature. Whether the real goal of the individuation process is the Dionysian frenzy of the Bacchae or the mystical vision of the saints is perhaps an insoluble problem. It is probably also impossible to validate by any independent process the fundamental principles of Jung's psychology. One can only point to the revolutionary nature of their real meaning and to the fact that such a psychology could only have issued out of a real crisis in Western culture. The impossibility of correlating idea and feeling, or reason and imagination, has led to the disruption of Western thought.

In the broadest sense, Jung's principles and data are provided by the Gnostic-romantic tradition and by that subterranean area of human existence which has always been the province of dream and myth. It is Jung's purpose to bring meaning to this data by submitting it to the probing analysis of scientific inquiry. The critical question to be asked here is whether the data chosen by Jung are authentically open to this kind of probing. Jung denounces as "reductionism" any attempt to submit this data to causal and mechanistic principles of interpretation which are derived from the natural sciences. At most, such interpretations of unconscious data

can result in fragmentary and partial images which correspond to the "opinion" of the lower levels of Plato's divided line. Jung insists that unconscious data must be allowed to stand in their own reality and not be distorted by examining them through categories which are derived from the conscious mind. But here lies a major contradiction. No conscious or scientific understanding of unconscious data can be arrived at apart from the categories of conscious or rational analysis. Indeed, the German Romantics were far more true to the data which they had rediscovered by insisting that they could be understood or appropriated only by means of a suspension or obliteration of consciousness.

#### IV

The fallacy of Jung's approach is that he has accepted the imperialistic claims of the "scientific method" and naively believed that he could apply it to unconscious reality if only because that reality is genuinely real. The truth is that the unconscious datum with which he is concerned is not "scientific" if only because it is not fully susceptible to the categories of conscious analysis. Of course, Jung is truer to his data than he is to the announced claims of his method; but this contradiction at the center of his work obscures the most basic problems which his analysis entails. The basic critical question here is: is his unconscious datum real in that it is grounded in an ontological reality which transcends the individual subject, or is it mere imaginative phantasy which can lay no claim to a trans-subjective reality? The problem is posed by the fact that Jung has no means of validating the reality of his datum by any epistemological criteria which have a point of contact with scientific or rational analysis. One can either accept his data or not; and, finally, one's means of accepting or rejecting it revolves about the personal possibility of intuitively responding to the data. Here, Jung is like the poet whose image is only meaningful if the reader

can reproduce it in his own experience, except that Jung accompanies his imaginative visions with the demands that they be accepted as "real." At this point, his "psychology" comes very close to making a religious claim. Jung is as much a poet as he is a psychologist, and as much a religious seer as he is a poet (Freud was fully justified in renouncing Jung as a mystic and prophet). When one arrives at the heart of his method it is apparent that it is founded upon a suspension of consciousness which is no less radical than that practised by the romantic poet or the Zen Buddhist. If the "lower" reaches of the unconscious are the ultimately real, then there need be no question of submitting them to rational or scientific analysis. The result of this process is that the deeper movements and realities in the collective unconscious usurp the claim to reality of conscious phenomena. Insofar as the deeper unconscious data are by their very definition made possible only by the suspension of consciousness, then their exaltation to the plane of ultimate reality must necessitate the suspension of the reality of conscious phenomena. Jung fails to see the necessity of this conclusion; but, for that matter, he has not even sensed its possibility inasmuch as he refuses to ask real methodological or philosophical questions about his system (it is noteworthy that both Jung and his disciples have ignored the great German epistemological investigations from Dilthey to Scheler which might indeed have brought some light to their quandary). It must be apparent that Jung's very choice and definition of his data, and his intuitive method of exploring them, rest upon a theological-metaphysical system of panpsychism. It could not be otherwise as long as he accords his unconscious data with such high reality claims. That his panpsychism so closely mirrors the "perennial philosophy" of the pantheists is a consequence of his translation of deeply rooted mythical archetypes into the language of a psychology of the unconscious. If Mircea Eliade has successfully shown us that the "archaic metaphysics" of



the earliest civilizations was founded upon a revolt against concrete existence in historical time and an attempt at a periodic return to the mythical world of the primal beginnings of things, then Jung has shown us the way to a transformation of this archaic metaphysics into a psychological language which has real meaning for contemporary Western man. In this perspective, Jung's speculations concerning the involution and evolution of the Self to cosmic totality (as contained, for example, in *Psychology and Alchemy*) are inherent in the very data which he has chosen to explore. The truly remarkable thing is that the romantics, mystics, and "psychologists" of so many ages who have dedicated themselves to a study of these dark and hidden phenomena should apparently have independently arrived at systems which are so similar. It is this coincidence which, at bottom, is Jung's chief claim to the veracity of his system; and it cannot fail to impress all those who have fallen under the spell of the eternal *Gnosis*.

*The Force that through the green fuse drives the flower  
Drives my green age.*—DYLAN THOMAS.

## WALT WHITMAN AND THE SECRET OF HISTORY

*James E. Miller, Jr.*

WALT WHITMAN HAS ALWAYS seemed to evoke from his passionate readers responses remarkable in their intensity. From the fanatic loyalty of W. D. O'Connor, who with Whitman's help wrote "The Good Gray Poet," to the deep-seated revulsion of John Greenleaf Whittier, who threw his copy of the 1855 edition of *Leaves of Grass* into the fire, few poets have elicited such impassioned gestures of approval or disapproval from their readers.

The history of Whitman's reputation is filled with fascinating accounts of passionate attachments, explosive re-provals, denials and reversals. So much smoke has been produced by the heated controversies that it has been almost impossible to see distinctly what fed the flames. But it has always been clear that the passions of the participants have been deeply and directly involved.

A reexamination of the startlingly varied responses to Whitman of a select few 19th-century poets, together with a close look at the odd, seemingly irrational responses of a number of 20th-century poets, might reveal, in some small measure at least, that enigmatic element in *Leaves of Grass* which has both attracted and repelled with such radical force. In tracking this element, we shall, perhaps, discover what one responsible and perceptive reader called the lost secret of history.

## I. The Modern Image

Although Whitman warned against movements in his name, he has been repeatedly hailed as a symbolic leader and sometime saint. The most recent canonization has taken place in San Francisco, where the high priests of the beat generation have issued their manifestoes, read their poetry to jazz, and muttered their enigmas into their cool cups.

The celebrated poet of this beat generation is Allen Ginsberg, whose book, like Whitman's, became involved with the law over alleged obscenities. There are additional and deeper resemblances. We are told that Ginsberg's book was first to have been called *Yawp!*, after Whitman's primitive outcry in "Song of Myself," but that instead the beat poet finally settled on *Howl!*. His instinct was right. His poems are not so much a barbaric yawp as an agonizing howl.

Ginsberg's specific tribute to Whitman appears in a short poem, "A Supermarket in California" (dated 1955),<sup>1</sup> which opens:

What thoughts I have of you tonight, Walt Whitman, for  
I walked down the sidestreets under the trees with a headache  
self-conscious looking at the full moon.

In my hungry fatigue, and shopping for images, I went into  
the neon fruit supermarket, dreaming of your enumerations!

What peaches and what penumbras! Whole families shop-  
ping at night! Aisles full of husbands! Wives in the avocados,  
babies in the tomatoes!—and you Garcia Lorca, what were  
you doing down by the watermelons?

I saw you, Walt Whitman, childless, lonely old grubber,  
poking among the meats in the refrigerator and eyeing the  
grocery boys.

I heard you asking questions of each: Who killed the pork  
chops? What price bananas? Are you my Angel?

<sup>1</sup> Allen Ginsberg, *Howl!* (San Francisco: The City Lights Pocket Bookshop, 1956), pp. 23-24.

The lines recall, in a bizarre way, Whitman's line in "Song of Myself"—"I reach to the leafy lips, I reach to the polish'd breasts of melons." There is, running through the Ginsberg lines, as through many of the most brilliant passages of Whitman, a sexual symbolism and sexual identification that seems constantly on the verge of becoming embarrassingly explicit. In spite of the image of Whitman as the "lonely old grubber," Ginsberg's portrait of the poet ("dear father, graybeard, lonely old courage-teacher") is basically sympathetic, and as they wander (in Ginsberg's poetic imagination) out of the fruit supermarket into the night, they seem drawn together in a lonely communion derived from a secret understanding: they "stroll dreaming of the lost America of love."

Ginsberg's image of Whitman is a far cry from the image of the Good Gray Poet, or of the Poet of Democracy, or of the Singer of America. But the beat generation was not the first to envision an off-beat image of Whitman. Dylan Thomas, in a poem only recently published (in *Letters to Vernon Watkins*, 1957) but contained in a 1940 letter,<sup>2</sup> sketches an unusual Whitman. Thomas explains in his letter: "I've got very little to say about it [the poem] myself: you'll see the heavy hand with which I make fun of this middle-class, beardless Walt who props humanity, in his dirty, weeping, expansive moments, against corners & counters & tries to slip, in grand delusions of all embracing humanitarianism, everyone into himself." In the poem, Whitman's long line with its majestic sweep of all-inclusiveness is reduced to an absurd brevity, and Whitman's ecstatically sung catalogue is turned into a halting and niggling list of the ludicrous:

Beggars, robbers, inveiglers,  
Voices from manholes and drains,  
Maternal short time pieces,  
Octopuses in doorways,

<sup>2</sup> Vernon Watkins, ed., *Letters to Vernon Watkins* (New York: New Directions, 1957), pp. 85-90.

Dark inviters to keyholes  
 And evenings with great danes,  
 Bedsitting girls on the beat  
 With nothing for the metre,  
 Others whose single beds hold two  
 Only to make two ends meet,  
 All the hypnotised city's  
 Insidious procession  
 Hawking for money and pity  
 Among the hardly pressed.

Thomas is not writing a parody of Whitman so much as a parody of himself imitating Whitman: "And I . . . / Conjured me to resemble / A singing Walt." This singing Walt does bear some resemblance to Ginsberg's Walt poking among the pork chops at the supermarket: both Whitmans are reduced considerably in size and rendered less mythic, more human. Indeed, Thomas's identification with the poet, like Ginsberg's communion, suggests an intimacy which the reader can observe but cannot share. Thomas, too, seems to have his secret with Walt, a secret which runs much deeper than the jumbled surface of his poem.

A comparable tone of intimacy, which seems to derive from similar depths of secret familiarity, is found in the Spanish poet Federico Garcia Lorca's "Ode to Walt Whitman" (a part of his *Poet in New York*, written in 1929-30).<sup>3</sup> We do not read far into this modern vision of a spiritually desolate city before we discover a Whitman of extraordinary attributes:

Not for one moment, Walt Whitman, comely old man,  
 have I ceased to envision your beard full of butterflies,  
 your corduroy shoulders, worn thin by the moon,  
 your chaste, Apollonian thighs,  
 your voice like a pillar of ashes;  
 patriarch, comely as mist,

<sup>3</sup> Federico Garcia Lorca, *Poet in New York*, translated by Ben Belitt (New York: Grove Press, 1953), pp. 118-127.

you cried like a bird  
 whose sex is transfixed by a needle;  
 satyr's antagonist,  
 grapevine's antagonist,  
 and lover of bodies under the nap of the cloth.

With his "beard full of butterflies," his "chaste, Apollonian thighs," and his "transfixed" sex, Whitman is the symbol of agonized purity opposed in the poem to the "perverts of the cities," the "mothers of filthiness, harpies, sleeplessly thwarting / the Love that apportions us garlands of pleasure." As the poem increases in bitter condemnation of the perverts and "toadies," it increases in intensity of shared feeling with "handsome Walt Whitman." As in Ginsberg's and Thomas's Whitman, there seem to be lurking in Lorca's image of the poet enigmatic qualities which only Lorca fully and sympathetically comprehends.

Hart Crane, in the "Cape Hatteras" section of "The Bridge"<sup>4</sup> may seem on first glance to present a more conventional Whitman than Lorca's, Thomas's, or Ginsberg's. Crane seems to invoke Whitman as his and the nation's creative daemon or divinity:

Our Meistersinger, thou set breath in steel;  
 And it was thou who on the boldest heel  
 Stood up and flung the span on even wing  
 Of that great Bridge, our Myth, whereof I sing!

But this "national" Whitman is not the conventional, yawping American chauvinist, but the maker of a complex myth of possible future fulfillment. A note of intimacy is introduced early in "Cape Hatteras":

Or to read you, Walt—knowing us in thrall  
 To that deep wonderment, our native clay  
 Whose depth of red, eternal flesh of Pocahontus—

Basic to Whitman's myth (as delineated by Crane) is his sexual insight into man's thralldom to his "native clay," a

<sup>4</sup> Hart Crane, *The Collected Poems* (New York, 1933), pp. 31-39.

fundamental element of man's nature celebrated elsewhere in "The Bridge" in the figure of Pocahontus as emblem of the eternal female principle. But also basic to the myth is Whitman's spiritual insight into man's adhesive attachment to his comrade, the Whitman of "Recorders Ages Hence" in "Calamus":

. . . in pure impulse inbred  
To answer deepest soundings! O, upward from the dead  
Thou bringest tally, and a pact, new bound,  
Of living brotherhood!

Though Crane's Whitman is elevated to a national myth-maker, he is not inflated into a gaseous, windy orator. Indeed, that suggestion of a complex vision intuitively shared, present in Ginsberg, Lorca, and Thomas, runs through all Crane's lines, including the closing:

Yes, Walt,  
Afoot again, and onward without halt,—  
Not soon, nor suddenly,—No, never to let go  
My hand  
    in yours,  
Walt Whitman—  
so—

## II. The Bewildering Response

Crane, Thomas, Lorca, and Ginsberg all participate in the creation of a 20th-century Walt Whitman who was relatively unknown in the 19th century. This lonely old grubber, with butterflies in his beard, expansively singing as he strolls hand in hand with his comrade-poets, is something of an eccentric and an exile—but mystically appealing and containing unplumbed depths of human understanding.

During Whitman's own time, two images of him warred with each other, neither ever quite firmly established, but both so strongly asserted that subtle composites or radically new characterizations seemed impossible. The poet's friends



and the poet himself promulgated the image of the Good Gray Poet—an image so inhumanly pure and innocent that even Whitman's strongest 20th-century admirers reject it. The poet's enemies, abetted by the tight-lipped disapproval of the genteel tradition, painted a picture of sexual indecency and moral depravity that can only draw a smile from the sophisticated modern reader.

The 19th century's insistence on a Whitman absolutely pure or totally depraved resulted in some curious and revealing incidents in the erratic growth of the poet's reputation. As there was no middle ground to which to retreat, 19th-century readers, when they did not simply ignore Whitman, usually became deeply involved, either as disciple or enemy. Some, like W. D. O'Connor and Horace Traubel, made up the band of hot little prophets that seemed to fight for Whitman's deification. Others, who generally preferred the anonymity of such organizations as Anthony Comstock's Society for the Suppression of Vice, denounced, sometimes violently, the obscenity of both the poet and his book.

In the midst of this strange struggle, it should not be surprising to find curious ambivalences and even sudden reversals in the 19th-century response to Whitman. Many commentaries could be cited, but three important ones should suffice to illustrate the pattern: those of Ralph Waldo Emerson, Sidney Lanier, and Algernon C. Swinburne. Each of these writers reacted to Whitman in a special way. Emerson's initial enthusiastic letter was followed by a long silence. Lanier attempted to explain the conflict in his emotional and intellectual response. Swinburne began in adulation and ended in vilification.

In many ways Emerson's brief letter,<sup>5</sup> properly titled the most significant letter in American literature, contains some of the most astute criticism of Whitman ever written, and it

<sup>5</sup> Louis Untermeyer, ed., *The Poetry and Prose of Walt Whitman: with a biographical introduction and a basic selection of early and recent critical commentary* (New York: Simon and Schuster, 1949), pp. 963-64.

was apparently dashed off in the first flush of a strong, sympathetic response to that 1855 edition: "I am very happy in reading [*Leaves of Grass*], as great power makes us happy. . . . I give you joy of your free and brave thought. . . . I find the courage of treatment which so delights us, and which large perception only can inspire. . . the solid sense of the book is a sober certainty." *Solid sense, courage of treatment, free and brave thought*—these are not the casual phrases of a polite thank-you note, but the profound tribute of a deep, spontaneous impression. Whatever the ethics involved in Whitman's unauthorized use of the letter to publicize his book, Whitman was certainly right in gauging the success of his poetry by this one intelligent and unsolicited reaction. Emerson's closing sentence—"I wish to see my benefactor, and have felt much like striking my tasks and visiting New York to pay you my respects"—suggests that same desire to stroll hand in hand expressed by Crane and Ginsberg. Indeed, that personal note of intimate and even exhilarated understanding dominates Emerson's letter. The reason for Emerson's subsequent silence, even to the exclusion of Whitman from his 1874 anthology of American poetry, will probably remain obscure. But we may guess that Emerson felt the Victorian necessity of atoning for the "sin" of this one indecent exposure of his raw, instinctive response. The feelings called forth by Whitman's powerful poetry might prove troublesome, even if one attempted to clothe their nakedness in the garments of gentility.

Sidney Lanier, in a confession of his honest response to *Leaves of Grass*, began with a staggering series of qualifications which Emerson probably wished he had made in his 1855 letter—and which he might have made had he expected publication. But Lanier apparently felt the strong necessity of bringing his imprecise emotional involvement into some kind of intellectual focus, and as a result tripped himself up in one of the oddest—and funniest—commentaries ever made on Whitman:

Here let me first carefully disclaim and condemn all that flip-pant and sneering tone which dominates so many discussions of Whitman. While I differ from him utterly as to every principle of artistic procedure; while he seems to me the most stupendously mistaken man in all history as to what constitutes true democracy, and the true advance of art and man; while I am immeasurably shocked at the sweeping invasions of those reserves which depend on the very personality I have so much insisted upon, and which the whole consensus of the ages has considered more and more sacred with every year of growth in delicacy; yet, after all these prodigious allowances, I owe some keen delights to a certain combination of bigness and naivety which makes some of Whitman's passages so strong and taking, and indeed, on the one occasion when Whitman has abandoned his theory of formlessness and written in form he has made *My Captain, O my Captain* surely one of the most tender and beautiful poems in any language.<sup>6</sup>

Surely very few paragraphs in all of criticism begin with such a bang and end with such a whimper. After the considerable build-up to Whitman's *bigness and naivety*, we are offered not a "strong and taking" example—possibly one of those "sweeping invasions"—but the flat and jingling *My Captain, O my Captain*: the very mistitling suggests the violent application of the brakes on an untravelled sideroad and a sudden return to the public highway. But in spite of Lanier's shifting directions, he gives us a momentary glimpse, in acknowledging "some keen delights," of a personal Whitman related to Emerson's or Ginsberg's.

Unlike Emerson, Swinburne wrote his first, enthusiastic praise of Whitman for publication. In his essay on Blake, Swinburne selected Whitman as the measure of comparison:

The points of contact and sides of likeness between William Blake and Walt Whitman are so many and so grave, as to afford some ground of reason to those who preach the transition of souls or transfusion of spirits. The great American is not a more passionate preacher of sexual or political freedom

<sup>6</sup> Sidney Lanier, *The English Novel*, ed. by Clarence Gohdes and Kemp Malone (Baltimore, 1945), p. 39.

than the English artist. . . . To each all sides and shapes of life are alike acceptable or endurable. From the fresh free ground of either workman nothing is excluded that is not exclusive. The words of either strike deep and run wide and soar high.<sup>7</sup>

This bold, daring praise, with emphasis on the *fresh free ground*, the deep striking and the high soaring, recalls the exhilarated response of Emerson and the reluctant response of Lanier. But Swinburne adds a touch of casual defiance in his admiration for the *passionate preacher of sexual freedom*. These words must have burned in his mind when, some twenty years later, Swinburne recanted with the same intense energy of his earlier praise.

But under the dirty clumsy paws of a harper whose plectrum is a muck-rake any tone will become a chaos of discords. . . . Mr. Whitman's Eve is a drunken apple-woman, indecently sprawling in the slush and garbage of the gutter amid the rotten refuse of her overturned fruit-stall . . . Mr. Whitman's Venus is a Hottentot wench under the influence of cantharides and adulterated rum.<sup>8</sup>

Twenty years can make a lot of difference, especially in one's sexual views. But there seems to be an unreasoned hostility, perhaps based on fear, in Swinburne's vitriolic attack. We can only exclaim with Whitman (when he was informed of Swinburne's switch from prophet to enemy), "Ain't he the damndest simulacrum."

### III. Virgins, Dynamos, and Sex

In reading Emerson, Lanier, and Swinburne, we recognize, if but fleetingly, a common ground with Crane, Lorca, Thomas, and Ginsberg. But the chasm that separates the previous age from the present cannot be easily bridged.

In search of a link, we might well begin with a 19th-century figure who lived on into the 20th. Henry Adams' search for the secret of history took him far beyond both of the centuries

<sup>7</sup> Louis Untermeyer, ed., *op. cit.*, p. 996.

<sup>8</sup> *Ibid.*, p. 1005.

in which he lived. But it was the powerful dynamo of his own industrial age that gave him the clue he sought. The clue led back to the 13th-century Virgin. Having identified history as sequence, Adams examined and rejected in turn the sequence of men, the sequence of society, the sequence of time, the sequence of thought. He came around finally to the sequence of force, which yielded a logical connection between the 13th century's Virgin and the 19th century's Dynamo.

Upon discovering this connection, Adams next raised the question of sex as force:

. . . any one brought up among Puritans knew that sex was sin. In any previous age, sex was strength. Neither art nor beauty was needed. Everyone, even among Puritans, knew that neither Diana of the Ephesians nor any of the Oriental goddesses was worshipped for her beauty. She was goddess because of her force; she was the animated dynamo; she was reproduction—the greatest and most mysterious of all energies; all she needed was to be fecund.

Observing in passing the significant creative link between Lucretius' invocation of Venus and Dante's invocation of the Virgin, Adams turned finally to the American mind and American art (he refers to himself in his *Education* in the third person):

On one side, at the Louvre and at Chartres [cities containing magnificent cathedrals], as he knew by the record of work actually done and still before his eyes, was the highest energy ever known to man, the creator of four-fifths of his noblest art, exercising vastly more attraction over the human mind than all the steam-engines and dynamos ever dreamed of; and yet this energy was unknown to the American mind. An American Virgin would never dare command; an American Venus would never dare exist. Adams began to ponder, asking himself whether he knew of any American artist who had ever insisted on the power of sex, as every classic had always done; but he could think only of Walt Whitman. . . . All the rest had used sex for sentiment, never for force. . . .<sup>9</sup>

<sup>9</sup> Henry Adams, *The Education of Henry Adams* (Boston, 1918), pp. 384-85.

There seems to be, in this one casual reference to Whitman, more revealed insight than in many a full treatise on the poet. Whitman emerges as neither the Good Gray Poet nor an obscene old man, but as the poet of sexual force, the poet of procreation. It was this fresh wind blowing through his *Leaves* that Emerson and Lanier and Swinburne felt but could not or would not identify. It is this enduring, magnetic energy in his work that constitutes the secret shared by Crane, Lorca, Thomas, and Ginsberg.

As Adams speculated on the relevance of the sexual force to history, Sigmund Freud explored the central significance of the force in the psyche, and, later, Alfred Kinsey discovered the intricate omnipresence of the force in society. It is time that criticism caught up with history and evaluated Whitman not with 19th-century reticence but with 20th-century reality—a reality he prophetically anticipated.

If, as Adams suggests, *Leaves of Grass* is one of those rare classics containing the lost secret of history, Whitman's sexual vision might well come under a fresh and frank scrutiny. Though that vision comes into precise focus in the "Children of Adam" cluster, where Whitman declares himself singer of "the song of procreation," it pervades the whole of *Leaves of Grass* so as to become impossible of disentanglement from the book's total meaning. If by some intricate method the sexual content of *Leaves* were to be expurgated, the book would lie maimed and impotent before us, its strength and its vitality obliterated. As well castrate a man as bowdlerize *Leaves of Grass*.

Whitman envisioned man's sexual energy as primal, creative energy, a simple extension of a creatively evolving natural world. When Whitman loafed at his ease and observed a spear of summer grass, he saw more than an isolated green blade. He saw himself and the grass impelled to growth and reproduction by an identical creative force. Whitman repeatedly dramatized the natural world in sexual terms, con-

stantly exploring the intimate kinship of nature and man.  
Such subtly sexual lines recur throughout *Leaves*:

Smile O voluptuous cool-breath'd earth!  
Earth of the slumbering and liquid trees!  
Earth of departed sunset—earth of the  
    mountains misty-topt!  
Earth of the vitreous pour of the full moon just  
    tinged with blue! (42)<sup>10</sup>

Indeed, Whitman might best be described as a "sexual pantheist," envisioning the world and man as infused by an identical, creative sexual vitality.

Whitman's sexual vision was comprehensive and shaped the opening sections (after the introductory cluster and poem) of *Leaves*: "Song of Myself," "Children of Adam," and "Calamus." These poems give *Leaves of Grass* its substantial sexual foundation. Freud later was to identify the three sexual stages of man as auto-, homo-, and hetero-sexual. Whitman has reversed the order of these last two stages, probably for programmatic purposes: he dramatizes in succession the relationship of man to self, of man to woman, of man to man: identity, love, and friendship.

Invariably in Whitman's sexual vision the physical vitality is prelude to the spiritual. The sexual awakening or the achievement of sexual identity comes in the middle of "Song of Myself," in the celebrated passage on touch, which appears largely autoerotic:

Is this then a touch? quivering me to a new identity,  
Flames and ether making a rush for my veins,  
Treacherous tip of me reaching and crowding to help them,  
My flesh and blood playing out lightning to strike  
    what is hardly different from myself,  
On all sides prurient provokers stiffening my limbs,  
Straining the udder of my heart for its withheld drip. . . . (49)

<sup>10</sup> Whitman's lines are identified in the text by page number of the Emory Holloway (ed.) Inclusive Edition of *Leaves of Grass* (New York: Doubleday, 1957).



This passage continues developing in intensity until, with the cry, "Unclench your floodgates," a climax is reached, followed by the calm retrospect and a return to the poem's dominant image: "I believe a leaf of grass is no less than the journey-work of the stars." This entire passage represents the marvelous achievement of sexual identity through experiencing directly the sense of touch. This development of an acute physical self-consciousness is, in the poem's drama, one of the major stages on the way to spiritual identity and the mystic merge.

In "Children of Adam" Whitman turns from man alone to man and woman. The poems of this cluster are to "Celebrate you act divine and you children prepared for, / And you stalwart loins." In one of these poems of procreation, "I Sing the Body Electric," the sexual drama is extended to the rhythmical flow of time itself:

Ebb stung by the flow and flow stung by the ebb,  
 love-flesh swelling and deliciously aching,  
 Limitless limpid jets of love hot and enormous,  
 quivering jelly of love, white-blow and  
 delirious juice,  
 Bridegroom night of love working surely and  
 softly into the prostrate dawn,  
 Undulating into the willing and yielding day,  
 Lost in the cleave of the clasping and sweet-  
 flesh'd day. (82)

The vivid celebrations of heterosexual love in "Children of Adam" are accompanied by an insistence throughout on the spiritual innocence of the physical act. "I Sing the Body Electric" concludes: "O I say these are not the parts and poems of the body only, but of the soul, / O I say now these are the soul!" (86) The dominant metaphor of the cluster of poems, suggested by the title, is the Garden. The poet calls for a return to the innocent sexual existence of Adam and Eve in Eden before the Fall.

From man-woman love in "Children of Adam" Whitman turns finally to man-man love in "Calamus," pairing, as many essayists (including Emerson) had done before him, his concept of love with his concept of friendship. And like previous writers relating these two themes, Whitman uses some of the same terms of passion for the two relationships. He is concerned with drawing a clear distinction:

Fast-anchor'd eternal O love! O woman I love!  
 O bride! O wife! more resistless than I can tell,  
     the thought of you!  
 Then separate, as disembodied or another born,  
 Ethereal, the last athletic reality, my consolation,  
 I ascend, I float in the regions of your love O man,  
 O sharer of my roving life. (112)

The "Calamus" cluster may be interpreted variously as a homosexual proclamation, confession, inadvertent revelation, or sublimation—depending on one's psychoanalytical bent. But the poems' intensity of emotion strikes home as entirely honest. And the intensity is matched by an impressive breadth. Whitman ranges from the complexity of the single relationship to the vision of a democratic brotherhood based on a multiplicity of such relationships. In these poems Whitman explores and celebrates friendship in all its democratic possibilities and religious implications—as well as its Freudian subtleties.

No poet before Whitman had been so bold or so deep in his insight into the sexual intricacies of man. In vividly dramatizing the emotional complexity of man's sexual nature, Whitman was bound, naturally, both to attract and repel. Hence that ambivalence in such 19th-century readers as Emerson, Lanier, and Swinburne—drawn by the fresh honesty of the vision, but frightened by its naive boldness. Sensitive 20th-century readers, like Crane, Lorca, Thomas, and Ginsberg, have taken the honesty and the boldness as their private secret. They respond to the emotional validity of the

sexual vision and accept that personal invitation to intimacy that seems to emanate from every page of *Leaves of Grass*.

Whitman was one of those "Beginners" he so knowingly described—"How dear and dreadful they are to the earth . . . /How people respond to them, yet know them not." (7-8) After Whitman, the sexual force achieved solid recognition in clinic and laboratory through the investigations of such imaginative scientists as Freud and Kinsey. It came to play a central role, too, in a considerable body of literature produced by some major talents—notably Lawrence and Joyce. One wonders, even, what obscure debt Vladimir Nabokov and his nymphet owe to that lonely, old Beginner, Walt Whitman.

At the end of his poetic career, in "A Backward Glance O'er Travel'd Roads," Whitman reaffirmed the sexual bias of his book: "'Leaves of Grass' is avowedly the song of Sex . . . the espousing principle of those lines so gives breath of life to my whole scheme that the bulk of the pieces might as well have been left unwritten were those lines omitted . . . the lines I allude to, and the spirit in which they are spoken, permeate all 'Leaves of Grass,' and the work must stand or fall with them . . ." (534) Whitman surely knew, as Henry Adams recognized, that in his sexual vision he had focused on a neglected historical force that was central to the human experience.